

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
19 April 2001 (19.04.2001)

PCT

(10) International Publication Number
WO 01/27857 A2

(51) International Patent Classification⁷: **G06F 19/00**

(21) International Application Number: PCT/US00/28413

(22) International Filing Date: 13 October 2000 (13.10.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/159,176	13 October 1999 (13.10.1999)	US
60/217,658	10 July 2000 (10.07.2000)	US
60/217,251	10 July 2000 (10.07.2000)	US
09/663,968	19 September 2000 (19.09.2000)	US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:

US	60/159,176 (CIP)
Filed on	13 October 1999 (13.10.1999)
US	60/217,658 (CIP)
Filed on	10 July 2000 (10.07.2000)
US	09/663,968 (CIP)
Filed on	19 September 2000 (19.09.2000)
US	60/217,251 (CIP)
Filed on	10 July 2000 (10.07.2000)

(71) Applicant (for all designated States except US): SE-
QUENOM, INC. [US/US]; 11555 Sorrento Valley Road,
San Diego, CA 92121-1331 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BRAUN, Andreas
[DE/US]; 11237-6 Carmel Creek Road, San Diego,
CA 92130 (US). KÖSTER, Hubert [DE/US]; 8636-C
Via Mallorca Drive, La Jolla, CA 92037 (US). VAN

DEN BOOM, Dirk [DE/DE]; Eppendorfer Weg 205
D, D-20253 Hamburg (DE). PING, Yip [US/US]; 3641
Copley Avenue, San Diego, CA 92116 (US). RODI,
Charlie [US/US]; 13823 Recuerdo Drive, Del Mar, CA
92014 (US). HE, Liyan [CN/US]; 10948 Creek Bridge
Place, San Diego, CA 92128 (US). CHIU, Norman
[CA/US]; 1128 Caminito Alvarez, San Diego, CA 92126
(US). JURINKE, Christian [DE/DE]; Rombergstrasse
22, 20255 Hamburg (DE).

(74) Agents: SEIDMAN, Stephanie, L. et al.; Heller Ehrman
White & McAuliffe, Suite 700, 4250 Executive Square, La
Jolla, CA 92037 (US).

(81) Designated States (national): AE, AG, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE,
DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,
ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO,
NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR,
TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— Without international search report and to be republished
upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC
MARKERS

(57) Abstract: Process and methods for creating a database of genomic samples from healthy human donors, methods that use the
database to identify and correlate polymorphic genetic markers and other markers with diseases and conditions are provided.

WO 01/27857 A2

BEST AVAILABLE COPY

**METHODS FOR GENERATING DATABASES AND DATABASES FOR
IDENTIFYING POLYMORPHIC GENETIC MARKERS**

RELATED APPLICATIONS

Benefit of priority to the following applications is claimed herein:

- 5 U.S. provisional application Serial No. 60/217,658 to Andreas Braun, Hubert
Koster; Dirk Van den Boom, filed July 10, entitled "METHODS FOR
GENERATING DATABASES AND DATABASES FOR IDENTIFYING
POLYMORPHIC GENETIC MARKERS"; U.S. provisional application Serial No.
60/159,176 to Andreas Braun, Hubert Koster, Dirk Van den Boom, filed October
10 13, 1999, entitled "METHODS FOR GENERATING DATABASES AND
DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS"; U.S.
provisional application Serial No. 60/217,251, filed July 10, 2000, to Andreas
Braun, entitled "POLYMORPHIC KINASE ANCHOR PROTEIN GENE SEQUENCES,
POLYMORPHIC KINASE ANCHOR PROTEINS AND METHODS OF DETECTING
15 POLYMORPHIC KINASE ANCHOR PROTEINS AND NUCLEIC ACIDS ENCODING
THE SAME"; and U.S. application Serial No. 09/663,968, to Ping Yip, filed
September 19, 2000, entitled "METHOD AND DEVICE FOR IDENTIFYING A
BIOLOGICAL SAMPLE."

- Where permitted that above-noted applications and provisional
20 applications are incorporated by reference in their entirety.

FIELD OF THE INVENTION

- Process and methods for creating a database of genomic samples from
healthy human donors. Methods that use the database to identify and correlate
with polymorphic genetic markers and other markers with diseases and
25 conditions are provided.

BACKGROUND

- Diseases in all organisms have a genetic component, whether inherited or
resulting from the body's response to environmental stresses, such as viruses
and toxins. The ultimate goal of ongoing genomic research is to use this
30 information to develop new ways to identify, treat and potentially cure these
diseases. The first step has been to screen disease tissue and identify genomic
changes at the level of individual samples. The identification of these "disease"

-2-

markers has then fueled the development and commercialization of diagnostic tests that detect these errant genes or polymorphisms. With the increasing numbers of genetic markers, including single nucleotide polymorphisms (SNPs), microsatellites, tandem repeats, newly mapped introns and exons, the challenge
5 to the medical and pharmaceutical communities is to identify genotypes which not only identify the disease but also follow the progression of the disease and are predictive of an organism's response to treatment.

Currently the pharmaceutical and biotechnology industries find a disease and then attempt to determine the genomic basis for the disease. This approach
10 is time consuming and expensive and in many cases involves the investigator guessing as to what pathways might be involved in the disease.

Genomics

Presently the two main strategies employed in analyzing the available genomic information are the technology driven reverse genetics brute force
15 strategy and the knowledge-based pathway oriented forward genetics strategy. The brute force approach yields large databases of sequence information but little information about the medical or other uses of the sequence information. Hence this strategy yields intangible products of questionable value. The knowledge-based strategy yields small databases that contain a lot of
20 information about medical uses of particular DNA sequences and other products in the pathway and yield tangible products with a high value.

Polymorphisms

Polymorphisms have been known since 1901 with the identification of blood types. In the 1950's they were identified on the level of proteins using
25 large population genetic studies. In the 1980's and 1990's many of the known protein polymorphisms were correlated with genetic loci on genomic DNA. For example, the gene dose of the apolipoprotein E type 4 allele was correlated with the risk of Alzheimer's disease in late onset families (see, *e.g.*, Corder *et al.* (1993) *Science* 261: 921-923; mutation in blood coagulation factor V was
30 associated with resistance to activated protein C (see, *e.g.*, Bertina *et al.* (1994) *Nature* 369:64-67); resistance to HIV-1 infection has been shown in caucasian individuals bearing mutant alleles of the CCR-5 chemokine receptor gene (see,

-3-

e.g., Samson *et al.* (1996) *Nature* 382:722-725); and a hypermutable tract in antigen presenting cells (APC, such as macrophages), has been identified in familial colorectal cancer in individuals of Ashkenzi jewish background (see, *e.g.*, Laken *et al.* (1997) *Nature Genet.* 17:79-83). There may be more than three
5 million polymorphic sites in the human genome. Many have been identified, but not yet characterized or mapped or associated with a marker.

Single nucleotide polymorphisms (SNPs)

Much of the focus of genomics has been in the identification of SNPs, which are important for a variety of reasons. They allow indirect testing
10 (association of haplotypes) and direct testing (functional variants). They are the most abundant and stable genetic markers. Common diseases are best explained by common genetic alterations, and the natural variation in the human population aids in understanding disease, therapy and environmental interactions.

15 Currently, the only available method to identify SNPs in DNA is by sequencing, which is expensive, difficult and laborious. Furthermore, once a SNP is discovered it must be validated to determine if it is a real polymorphism and not a sequencing error. Also, discovered SNPs must then be evaluated to determine if they are associated with a particular phenotype. Thus, there is a
20 need to develop new paradigms for identifying the genomic basis for disease and markers thereof. Therefore, it is an object herein to provide methods for identifying the genomic basis of disease and markers thereof.

SUMMARY

Databases and methods using the databases are provided herein. The
25 databases comprise sets of parameters associated with subjects in populations selected only on the basis of being healthy (*i.e.*, where the subjects are mammals, such as humans, they are selected based upon apparent health and no detectable infections). The databases can be sorted based upon one or more of the selected parameters.

30 The databases are preferably relational databases, in which an index that represents each subject serves to relate parameters, which are the data, such as age, ethnicity, sex, medical history, etc. and ultimately genotypic information,

-4-

that was inputted into and stored in the database. The database can then be sorted according to these parameters. Initially, the parameter information is obtained from a questionnaire answered by each subject from whom a body tissue or body fluid sample is obtained. As additional information about each
5 sample is obtained, this information can be entered into the database and can serve as a sorting parameter.

The databases obtained from healthy individuals have numerous uses, such as correlating known polymorphisms with a phenotype or disease. The databases can be used to identify alleles that are deleterious, that are beneficial,
10 and that are correlated with diseases.

For purposes herein, genotypic information can be obtained by any method known to those of skill in the art, but is preferably obtained using mass spectrometry.

Also provided herein, is a new use for existing databases of subjects and
15 genotypic and other parameters, such as age, ethnicity, race, and gender. Any database can be sorted according to the methods herein and alleles that exhibit statistically significant correlations with any of the sorting parameters can be identified. It is noted, however, is noted, that the databases provided herein and randomly selected databases will perform better in these methods, since disease-
20 based databases suffer numerous limitations, including their relatively small size, the homogeneity of the selected disease population, and the masking effect of the polymorphism associated with the markers for which the database was selected. Hence, the healthy database provided herein, provides advantages not heretofore recognized or exploited. However, the methods provided herein can
25 be used with a selected database, including disease-based databases, with or without sorting for the discovery and correlation of polymorphisms. In addition, the databases provided herein represent a greater genetic diversity than the unselected databases typically utilized for the discovery of polymorphisms and thus allow for the enhanced discovery and correlation of polymorphisms.

30 The databases provided herein can be used for taking an identified polymorphism, and ascertaining whether it changes in frequency when the data is sorted according to a selected parameter.

-5-

One use of these methods is correlating a selected marker with a particular parameter by following the occurrence of known genetic markers and then, having made this correlation, determining or identifying correlations with diseases. Examples of this use are p53 and Lipoprotein Lipase polymorphism.

- 5 As exemplified herein, known markers are shown to have particular correlation with certain groups, such as a particular ethnicity or race or one sex. Such correlations will then permit development of better diagnostic tests and treatment regimens.

- 10 These methods are valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex or some other criteria. This can allow the identification of previously unknown polymorphisms and ultimately a gene or pathway involved in the onset and progression of disease.

- 15 The databases and methods provided herein permit, among other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings and also permit an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new potential drug targets, and in identifying new drug candidates.

The methods and databases can be used with experimental procedures, including, but are not limited to, *in silico* SNP identification, *in vitro* SNP identification/verification, genetic profiling of large populations, and in biostatistical analyses and interpretations.

- 25 Also provided herein, are combinations that contain a database provided herein and a biological sample from a subject in the database, and preferably biological samples from all subjects or a plurality of subjects in the database. Collections of the tissue and body fluid samples are also provided.

- 30 Also, provided herein, are methods for determining a genetic marker that correlates with age, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

-6-

Further provided herein are methods for determining whether a genetic marker correlates with susceptibility to morbidity, early mortality, or morbidity and early mortality, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

5 Any of the methods herein described can be used out in a multiplex format.

Also provided are an apparatus and process for accurately identifying genetic information. It is another object of the herein that genetic information be extracted from genetic data in a highly automated manner. Therefore, to
10 overcome the deficiencies in the known conventional systems, a method and apparatus for identifying a biological sample is proposed.

Briefly, the method and system for identifying a biological sample generates a data set indicative of the composition of the biological sample. In a particular example, the data set is DNA spectrometry data received from a mass
15 spectrometer. The data set is denoised, and a baseline is deleted. Since possible compositions of the biological sample may be known, expected peak areas may be determined. Using the expected peak areas, a residual baseline is generated to further correct the data set. Probable peaks are then identifiable in the corrected data set, which are used to identify the composition of the
20 biological sample. In a disclosed example, statistical methods are employed to determine the probability that a probable peak is an actual peak, not an actual peak, or that the data too inconclusive to call.

Advantageously, the method and system for identifying a biological sample accurately makes composition calls in a highly automated manner. In
25 such a manner, complete SNP profile information, for example, may be collected efficiently. More importantly, the collected data is analyzed with highly accurate results. For example, when a particular composition is called, the result may be relied upon with great confidence. Such confidence is provided by the robust computational process employed .

30 DESCRIPTION OF THE DRAWINGS

-7-

Figure 1 depicts an exemplary sample bank. Panel 1 shows the samples as a function of sex and ethnicity. Panel 2 shows the caucasians as a function of age. Panel 3 shows the Hispanics as a function of age.

Figures 2A and 2C show an age- and sex-distribution of the 291S allele of the lipoprotein lipase gene in which a total of 436 males and 589 females
5 were investigated. Figure 2B shows an age distribution for the 436 males.

Figure 3 is an exemplary questionnaire for population-based sample banking.

Figure 4 depicts processing and tracking of blood sample components.

10 Figure 5 depicts the allelic frequency of "sick" alleles and "healthy" alleles as a function of age. It is noted that the relative frequency of healthy alleles increases in a population with increasing age.

Figure 6 depicts the age-dependent distribution of ApoE genotypes (see, Schächter *et al.* (1994) *Nature Genetics* 6:29-32).

15 Figure 7A-D depicts age-related and genotype frequency of the p53 (tumor suppressor) codon 72 among the caucasian population in the database. *R72 and *P72 represent the frequency of the allele in the database population. R72, R72P, and P72 represent the genotypes of the individuals in the population. The frequency of the homozygous P72 allele drops from 6.7% to 3.7% with
20 age.

Figure 8 depicts the allele and genotype frequencies of the p21 S31R allele as a function of age.

Figure 9 depicts the frequency of the FVII Allele 353Q in pooled versus individual samples.

25 Figure 10 depicts the frequency of the CETP (cholesterol ester transfer protein) allele in pooled versus individual samples

Figure 11 depicts the frequency of the plasminogen activator inhibitor-1 (PAI-1) 5G in pooled versus individual samples

30 Figure 12 shows mass spectra of the samples and the ethnic diversity of the PAI-1 alleles.

Figure 13 shows mass spectra of the samples and the ethnic diversity of the CETP 405 alleles.

-8-

Figure 14 shows mass spectra of the samples and the ethnic diversity of the Factor VII 353 alleles.

Figure 15 shows ethnic diversity of PAI-1, CETP and Factor VII using the pooled DNA samples.

5 Figure 16 shows the p53-Rb pathway and the relationships among the various factors in the pathway.

Figure 17, which is a block diagram of a computer constructed to provide and process the databases described herein, depicts a typical computer system for storing and sorting the databases provided herein and practicing the methods
10 provided herein.

Figure 18 is a flow diagram that illustrates the processing steps performed using the computer illustrated in Figure 17, to maintain and provide access to the databases for identifying polymorphic genetic markers.

Figure 19 is a histogram showing the allele and genotype distribution in
15 the age and sex stratified Caucasian population for the AKAP10-1 locus. Bright green bars show frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

Figure 20 is a histogram showing the allele and genotype distribution in
20 the age and sex stratified Caucasian population for the AKAP10-5 locus. Bright green bars show frequencies in individuals younger than 40 years; dark green bars show frequencies in individuals older than 60 years.

Figure 21 is a histogram showing the allele and genotype distribution in
the age and sex stratified Caucasian population for the h-msrA locus. Genotype difference between male age groups is significant. Bright green bars show
25 frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

Figure 22A-D is a sample data collection questionnaire used for the healthy database.

Figure 23 is a flowchart showing processing performed by the computing
30 device of Figure 24 when performing genotyping of sense strands and antisense strands from assay fragments.

Figure 24 is a block diagram showing a system in accordance with the present invention;

Figure 25 is a flowchart of a method of identifying a biological sample in accordance with the present invention;

5 Figure 26 is a graphical representation of data from a mass spectrometer;
 Figure 27 is a diagram of wavelet transformation of mass spectrometry data;

Figure 28 is a graphical representation of wavelet stage 0 hi data;

Figure 29 is a graphical representation of stage 0 noise profile;

10 Figure 30 is a graphical representation of generating stage noise standard deviations;

Figure 31 is a graphical representation of applying a threshold to data stages;

Figure 32 is a graphical representation of a sparse data set;

15 Figure 33 is a formula for signal shifting;

Figure 34 is a graphical representation of a wavelet transformation of a denoised and shifted signal;

Figure 35 is a graphical representation of a denoised and shifted signal;

Figure 36 is a graphical representation of removing peak sections;

20 Figure 37 is a graphical representation of generating a peak free signal ;

Figure 38 is a block diagram of a method of generating a baseline correction;

Figure 39 is a graphical representation of a baseline and signal;

Figure 40 is a graphical representation of a signal with baseline removed;

25 Figure 41 is a table showing compressed data;

Figure 42 is a flowchart of method for compressing data;

Figure 43 is a graphical representation of mass shifting;

Figure 44 is a graphical representation of determining peak width;

Figure 45 is a graphical representation of removing peaks;

30 Figure 46 is a graphical representation of a signal with peaks removed;

Figure 47 is a graphical representation of a residual baseline;

-10-

Figure 48 is a graphical representation of a signal with residual baseline removed;

Figure 49 is a graphical representation of determining peak height;

Figure 50 is a graphical representation of determining signal-to-noise for
5 each peak;

Figure 51 is a graphical representation of determining a residual error for each peak;

Figure 52 is a graphical representation of peak probabilities;

Figure 53 is a graphical representation of applying an allelic ratio to peak
10 probability;

Figure 54 is a graphical representation of determining peak probability

Figure 55 is a graphical representation of calling a genotype;

Figure 56 is a flowchart showing a statistical procedure for calling a
genotype;

15 Figure 57 is a flowchart showing processing performed by the computing device of Figure 1 when performing standardless genotyping; and

Figure 58 is graphical representation of applying an allelic ratio to peak probability for standardless genotype processing.

DETAILED DESCRIPTION

20 Definitions

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by one of ordinary skill in the art to which this invention belongs. All patents, applications, published applications and other publications and sequences from GenBank and other
25 databases referred to herein throughout the disclosure are incorporated by reference in their entirety.

As used herein, a biopolymer includes, but is not limited to, nucleic acid, proteins, polysaccharides, lipids and other macromolecules. Nucleic acids include DNA, RNA, and fragments thereof. Nucleic acids may be derived from
30 genomic DNA, RNA, mitochondrial nucleic acid, chloroplast nucleic acid and other organelles with separate genetic material.

-11-

As used herein, morbidity refers to conditions, such as diseases or disorders, that compromise the health and well-being of an organism, such as an animal. Morbidity susceptibility or morbidity-associated genes are genes that, when altered, for example, by a variation in nucleotide sequence, facilitate the
5 expression of a specific disease clinical phenotype. Thus, morbidity susceptibility genes have the potential, upon alteration, of increasing the likelihood or general risk that an organism will develop a specific disease.

As used herein, mortality refers to the statistical likelihood that an organism, particularly an animal, will not survive a full predicted lifespan.
10 Hence, a trait or a marker, such as a polymorphism, associated with increased mortality is observed at a lower frequency in older than younger segments of a population.

As used herein, a polymorphism, e.g. genetic variation, refers to a variation in the sequence of a gene in the genome amongst a population, such as
15 allelic variations and other variations that arise or are observed. Thus, a polymorphism refers to the occurrence of two or more genetically determined alternative sequences or alleles in a population. These differences can occur in coding and non-coding portions of the genome, and can be manifested or detected as differences in nucleic acid sequences, gene expression, including,
20 for example transcription, processing, translation, transport, protein processing, trafficking, DNA synthesis, expressed proteins, other gene products or products of biochemical pathways or in post-translational modifications and any other differences manifested amongst members of a population. A single nucleotide polymorphism (SNP) refers to a polymorphism that arises as the result of a single
25 base change, such as an insertion, deletion or change in a base.

A polymorphic marker or site is the locus at which divergence occurs. Such site may be as small as one base pair (an SNP). Polymorphic markers include, but are not limited to, restriction fragment length polymorphisms, variable number of tandem repeats (VNTR's), hypervariable regions,
30 minisatellites, dinucleotide repeats, trinucleotide repeats, tetranucleotide repeats and other repeating patterns, simple sequence repeats and insertional elements, such as Alu. Polymorphic forms also are manifested as different mendelian

-12-

alleles for a gene. Polymorphisms may be observed by differences in proteins, protein modifications, RNA expression modification, DNA and RNA methylation, regulatory factors that alter gene expression and DNA replication, and any other manifestation of alterations in genomic nucleic acid or organelle nucleic acids.

5 As used herein, a healthy population, refers to a population of organisms, including but are not limited to, animals, bacteria, viruses, parasites, plants, eubacteria, and others, that are disease free. The concept of disease-free is a function of the selected organism. For example, for mammals it refers to a subject not manifesting any disease state. Practically a healthy subject, when
10 human, is defined as human donor who passes blood bank criteria to donate blood for eventual use in the general population. These criteria are as follows: free of detectable viral, bacterial, mycoplasma, and parasitic infections; not anemic; and then further selected based upon a questionnaire regarding history (see Figure 3). Thus, a healthy population represents an unbiased population of
15 sufficient health to donate blood according to blood bank criteria, and not further selected for any disease state. Typically such individuals are not taking any medications. For plants, for example, it is a plant population that does not manifest diseases pathology associated with plants. For bacteria it is a bacterial population replicating without environmental stress, such as selective agents,
20 heat and other pathogens.

 As used herein, a healthy database (or healthy patient database) refers to a database of profiles of subjects that have not been pre-selected for any particular disease. Hence, the subjects that serve as the source of data for the database are selected, according to predetermined criteria, to be healthy. In
25 contrast to other such databases that have been pre-selected for subjects with a particular disease or other characteristic, the subjects for the database provided herein are not so-selected. Also, if the subjects do manifest a disease or other condition, any polymorphism discovered or characterized should be related to an independent disease or condition. In a preferred embodiment, where the
30 subjects are human, a healthy subject manifests no disease symptoms and meets criteria, such as those set by blood banks for blood donors.

-13-

Thus, the subjects for the database are a population of any organism, including, but are not limited to, animals, plants, bacteria, viruses, parasites and any other organism or entity that has nucleic acid. Among preferred subjects are mammals, preferably, although not necessarily, humans. Such a database can
5 capture the diversity of the a population, thus providing for discovery of rare polymorphisms.

As used herein, a profile refers to information relating to, but not limited to and not necessarily including all of, age, sex, ethnicity, disease history, family history, phenotypic characteristics, such as height and weight and other relevant
10 parameters. A sample collect information form is shown in Figure 22, which illustrates profile intent.

As used herein, a disease state is a condition or abnormality or disorder that may be inherited or result from environmental stresses, such as toxins, bacterial, fungal and viral infections.

15 As used herein, set of non-selected subjects means that the subjects have not been pre-selected to share a common disease or other characteristic. They can be selected to be healthy as defined herein.

As used herein, a phenotype refers to a set of parameters that includes any distinguishable trait of an organism. A phenotype can be physical traits and
20 can be, in instances in which the subject is an animal, a mental trait, such as emotional traits. Some phenotypes can be determined by observation elicited by questionnaires (see, *e.g.*, Figures 3 and 22) or by referring to prior medical and other records. For purposes herein, a phenotype is a parameter around which the database can be sorted.

25 As used herein, a parameter is any input data that will serve as a basis for sorting the database. These parameters will include phenotypic traits, medical histories, family histories and any other such information elicited from a subject or observed about the subject. A parameter may describe the subject, some historical or current environmental or social influence experienced by the
30 subject, or a condition or environmental influence on someone related to the subject. Paramaters include, but are not limited to, any of those described herein, and known to those of skill in the art.

-14-

As used herein, haplotype refers to two or polymorphism located on a single DNA strand. Hence, haplotyping refers to identification of two or more polymorphisms on a single DNA strand. Haplotypes can be indicative of a phenotype. For some disorders a single polymorphism may suffice to indicate a trait; for others a plurality (i.e., a haplotype) may be needed. Haplotyping can be performed by isolating nucleic acid and separating the strands. In addition, when using enzymes such as certain nucleases, that produce, different size fragments from each strand, strand separation is not needed for haplotyping.

As used herein, pattern with reference to a mass spectrum or mass spectrometric analyses, refers to a characteristic distribution and number of signals (such as peaks or digital representations thereof).

As used herein, signal in the context of a mass spectrum and analysis thereof refers to the output data, which is the number or relative number of molecules having a particular mass. Signals include "peaks" and digital representations thereof.

As used herein, adaptor, when used with reference to haplotyping use Fen ligase, refers to a nucleic acid that specifically hybridizes to a polymorphism of interest. An adaptor can be partially double-stranded. An adaptor complex is formed when an adaptor hybridizes to its target.

As used herein, a target nucleic acid refers to any nucleic acid of interest in a sample. It can contain one or more nucleotides.

As used herein, standardless analysis refers to a determination based upon an internal standard. For example, the frequency of a polymorphism can be determined herein by comparing signals within a single mass spectrum.

As used herein, amplifying refers to means for increasing the amount of a bipolymer, especially nucleic acids. Based on the 5' and 3' primers that are chosen, amplification also serves to restrict and define the region of the genome which is subject to analysis. Amplification can be by any means known to those skilled in the art, including use of the polymerase chain reaction (PCR) etc.

Amplification, e.g., PCR must be done quantitatively when the frequency of polymorphism is required to be determined.

-15-

As used herein, cleaving refers to non-specific and specific fragmentation of a biopolymer.

As used herein, multiplexing refers to the simultaneous detection of more than one polymorphism. Methods for performing multiplexed reactions, particularly in conjunction with mass spectrometry are known (see, *e.g.*, U.S. Patent Nos. 6,043,031, 5,547,835 and International PCT application No. WO 97/37041).

As used herein, reference to mass spectrometry encompasses any suitable mass spectrometric format known to those of skill in the art. Such formats include, but are not limited to, Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI (see, *e.g.*, published International PCT application No.99/57318 and U.S. Patent No. 5,118,937), Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof. MALDI, particular UV and IR, are among the preferred formats.

As used herein, mass spectrum refers to the presentation of data obtained from analyzing a biopolymer or fragment thereof by mass spectrometry either graphically or encoded numerically.

As used herein, a blood component is a component that is separated from blood and includes, but is not limited to red blood cells and platelets, blood clotting factors, plasma, enzymes, plasminogen, immunoglobulins. A cellular blood component is a component of blood, such as a red blood cell, that is a cell. A blood protein is a protein that is normally found in blood. Examples of such proteins are blood factors VII and VIII. Such proteins and components are well-known to those of skill in the art.

As used herein, plasma can be prepared by any method known to those of skill in the art. For example, it can be prepared by centrifuging blood at a force that pellets the red cells and forms an interface between the red cells and the buffy coat, which contains leukocytes, above which is the plasma. For example, typical platelet concentrates contain at least about 10% plasma.

Blood may be separated into its components, including, but not limited to, plasma, platelets and red blood cells by any method known to those of skill in the art. For example, blood can be centrifuged for a sufficient time and at a

-16-

sufficient acceleration to form a pellet containing the red blood cells. Leukocytes collect primarily at the interface of the pellet and supernatant in the buffy coat region. The supernatant, which contains plasma, platelets, and other blood components, may then be removed and centrifuged at a higher acceleration, whereby the platelets pellet.

As used herein, p53 is a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulation gene which control cell growth, DNA repair and apoptosis. The p53 mutations have been found in a wide variety of different cancers, including all of the different types of leukemia, with varying frequency. The loss of normal p53 functions results in genomic instability and uncontrolled growth of the host cell.

As used herein, p21 is a cyclin-dependent kinase inhibitor, associated with G1 phase arrest of normal cells. Expression triggers apoptosis or programmed cell death and has been associated with Wilms' tumor, a pediatric kidney cancer.

As used herein, Factor VII is a serine protease involved the extrinsic blood coagulation cascade. This factor is activated by thrombin and works with tissue factor (Factor III) in the processing of Factor X to Factor Xa. Evidence has supported an association between polymorphisms in the gene and increase Factor VII activity which can result in an elevated risk of ischemic cardiovascular disease including myocardial infarction.

As used herein, a relational database stores information in a form representative of matrices, such as two-dimensional tables, including rows and columns of data, or higher dimensional matrices. For example, in one embodiment, the relational database has separate tables each with a parameter. The tables are linked with a record number, which also acts as an index. The database can be searched or sorted by using data in the tables and is stored in any suitable storage medium, such as floppy disk, CD rom disk, hard drive or other suitable medium.

As used herein, a bar codes refers any array of optically readable marks of any desired size and shape that are arranged in a reference context or frame of, preferably, although not necessarily, one or more columns and one or more

-17-

rows. For purposes herein, the bar code refers to any symbology, not necessary "bar" but may include dots, characters or any symbol or symbols.

As used herein, symbology refers to an identifier code or symbol, such as a bar code, that is linked to a sample. The index will reference each such

5 symbology. The symbology is any code known or designed by the user. The symbols are associated with information stored in the database. For example, each sample can be uniquely identified with an encoded symbology. The parameters, such as the answers to the questions and subsequent genotypic and other information obtained upon analysis of the samples is included in the

10 database and associated with the symbology. The database is stored on any suitable recording medium, such as a hard drive, a floppy disk, a tape, a CD ROM, a DVD disk and any other suitable medium.

DATABASES

Human genotyping is currently dependent on collaborations with

15 hospitals, tissues banks and research institutions that provide samples of disease tissue. This approach is based on the concept that the onset and/or progression of diseases can be correlated with the presence of a polymorphisms or other genetic markers. This approach does not consider that disease correlated with the presence of specific markers and the absence of specific markers. It is

20 shown herein that identification and scoring of the appearance and disappearance of markers is possible only if these markers are measured in the background of healthy subjects where the onset of disease does not mask the change in polymorphism occurrence. Databases of information from disease populations suffer from small sample size, selection bias and heterogeneity. The

25 databases provided herein from healthy populations solve these problems by permitting large sample bands, simple selection methods and diluted heterogeneity.

Provided herein are first databases of parameters, associated with non-selected, particularly healthy, subjects. Also provided are combinations of the

30 databases with indexed samples obtained from each of the subjects. Further provided are databases produced from the first databases. These contain in addition to the original parameters information, such as genotypic information,

-18-

including, but are not limited to, genomic sequence information, derived from the samples.

The databases, which are herein designated healthy databases, are so-designated because they are not obtained from subjects pre-selected for a particular disease. Hence, although individual members may have a disease, the collection of individuals is not selected to have a particular disease.

The subjects from whom the parameters are obtained comprise either a set of subjects who are randomly selected across, preferably, all populations, or are pre-selected to be disease-free or healthy. As a result, the database is not selected to be representative of any pre-selected phenotype, genotype, disease or other characteristic. Typically the number of subjects from which the database is prepared is selected to produce statistically significant results when used in the methods provided herein. Preferably, the number of subjects will be greater than 100, more preferably greater than 200, yet more preferably greater than 1000. The precise number can be empirically determined based upon the frequency of the parameter(s) that be used to sort the database. Generally the population can have at least 50, at least 100, at least 200, at least 500, at least 1000, at least 5000 or at least 10,000 or more subjects.

Upon identification of a collection of subjects, information about each subject is recorded and associated with each subject as a database. The information associated with each of the subjects, includes, but is not limited to, information related to historical characteristics of the subjects, phenotypic characteristics and also genotypic characteristics, medical characteristics and any other traits and characteristics about the subject that can be determined. This information will serve as the basis for sorting the database.

In an exemplary embodiment, the subjects are mammals, such as humans, and the information relates to one or more of parameters, such as age, sex, medical history, ethnicity and any other factor. Such information, when the animals are humans, for example, can be obtained by a questionnaire, and by observations about the individual, such as hair color, eye color and other characteristics. Genotypic information will be obtained from tissue or other body and body fluid samples from the subject.

-19-

The healthy genomic database can include profiles and polymorphisms from healthy individuals from a library of blood samples where each sample in the library is an individual and separate blood or other tissue sample. Each sample in the database is profiled as to the sex, age, ethnic group, and disease
5 history of the donor.

The databases are generated by first identifying healthy populations of subjects and obtaining information about each subject that will serve as the sorting parameters for the database. This information is preferably entered into a storage medium, such as the memory of a computer.

10 The information obtained about each subject in a population used for generating the database is stored in a computer memory or other suitable storage medium. The information is linked to an identifier associated with each subject. Hence the database will identify a subject, for example by a datapoint representative of a bar code, and then all information, such as the information
15 from a questionnaire, regarding the individual is associated with the datapoint. As the information is collected the database is generated.

Thus, for example, profile information, such as subject histories obtained from questionnaires, is collected in the database. The resulting database can be sorted as desired, using standard software, such as by age, sex and/or ethnicity.
20 An exemplary questionnaire for subjects from whom samples are to be obtained is shown in Figures 22A-D. Each questionnaire preferably is identified by a bar code, particularly a machine readable bar code for entry into the database. After a subject provides data and is deemed to be healthy (*i.e.*, meets standards for blood donation), the data in the questionnaire is entered into the database and is
25 associated with the bar code. A tissue, cell or blood sample is obtained from the subject.

Figure 4 exemplifies processing and tracking of blood sample components. Each component is tracked with a bar code, dated, is entered into the database and associated with the subject and the profile of the subject.
30 Typically, the whole blood is centrifuged to produce plasma, red blood cells (which pellet) and leukocytes found in the buffy coat which layers in between.

-20-

Various samples are obtained and coded with a bar code and stored for use as needed.

Samples are collected from the subjects. The samples include, but are not limited to, tissues, cells, and fluids, such as nucleic acid, blood, plasma, amniotic fluid, synovial fluid, urine, saliva, aqueous humor, sweat, sperm samples and cerebral spinal fluid. It is understood that the particular set of samples depends upon the organisms in the population.

Once samples are obtained the collection can be stored and, in preferred embodiments, each sample is indexed with an identifier, particularly a machine readable code, such as a bar code. For analyses, the samples or components of the samples, particularly biopolymers and small molecules, such as nucleic acids and/or proteins and metabolites, are isolated.

After samples are analyzed, this information is entered into the database in the memory of the storage medium and associated with each subject. This information includes, but is not limited to, genotypic information. Particularly, nucleic acid sequence information and other information indicative of polymorphisms, such as masses of PCR fragments, peptide fragment sequences or masses, spectra of biopolymers and small molecules and other indicia of the structure or function of a gene, gene product or other marker from which the existence of a polymorphism within the population can be inferred.

In an exemplary embodiment, a database can be derived from a collection of blood samples. For example, Figure 1 (see, also Figure 10) shows the status of a collection of over 5000 individual samples. The samples were processed in the laboratory following SOP (standard operating procedure) guidelines. Any standard blood processing protocol may be used.

For the exemplary database described herein, the following criteria were used to select subjects:

No testing is done for infectious agents.

Age: At least 17 years old

Weight: Minimum of 110 pounds

Permanently Disqualified:

History of hepatitis (after age 11)

-21-

Leukemia Lymphoma

Human immunodeficiency virus (HIV), AIDS

Chronic kidney disease

Temporarily Disqualified:

- 5 Pregnancy - until six weeks after delivery, miscarriage or abortion
Major surgery or transfusions - for one year
Mononucleosis - until complete recovery
Prior whole blood donation - for eight weeks
Antibiotics by injection for one week; by mouth, for forty-eight hours,
10 except antibiotics for skin complexion;

5 year Deferment:

Internal cancer and skin cancer if it has been removed, is healed and
there is no recurrence

These correspond to blood bank criteria for donating blood and represent a

- 15 healthy population as defined herein for a human healthy database.

Structure of the database

- Any suitable database structure and format known to those of skill in the
art may be employed. For example, a relational database is a preferred format in
which data is stored as matrices or tables of the parameters linked by an indexer
20 that identifies each subject. Software for preparing and manipulating, including
sorting the database, can be readily developed or adapted from commercially
available software, such as Microsoft Access.

Quality control

- Quality control procedures can be implemented. For example, after
25 collection of samples, the quality of the collection in the bank can be assessed.
For example, mix-up of samples can be checked by testing for known markers,
such as sex. After samples are separated by ethnicity, samples are randomly
tested for a marker associated with a particular ethnicity, such as HLA DQA1
group specific component, to assess whether the samples have been properly
30 sorted by ethnic group. An exemplary sample bank is depicted in Figure 4.

-22-

Obtaining genotypic data and other parameters for the database

After informational and historical parameters are entered into the database, material from samples obtained from each subject, is analyzed.

- Analyzed material include proteins, metabolites, nucleic acids, lipids and any
5 other desired constituent of the material. For example, nucleic acids, such as genomic DNA, can be analyzed by sequencing.

- Sequencing can be performed using any method known to those of skill in the art. For example, if a polymorphism is identified or known, and it is desired to assess its frequency or presence among the subjects in the database, the
10 region of interest from each sample can be isolated, such as by PCR or restriction fragments, hybridization or other suitable method known to those of skill in the art and sequenced. For purposes herein, sequencing analysis is preferably effected using mass spectrometry (see, *e.g.*, U.S. Patent Nos. 5,547,835, 5,622,824, 5,851,765, and 5,928,906). Nucleic acids can also be
15 sequence by hybridization (see, *e.g.*, U.S. Patent Nos. 5,503,980, 5,631,134, 5,795,714) and including analysis by mass spectrometry (see, U.S. application Serial Nos. 08/419,994 and 09/395,409).

- In other detection methods, it is necessary to first amplify prior to identifying the allelic variant. Amplification can be performed, *e.g.*, by PCR
20 and/or LCR, according to methods known in the art. In one embodiment, genomic DNA of a cell is exposed to two PCR primers and amplification for a number of cycles sufficient to produce the required amount of amplified DNA. In preferred embodiments, the primers are located between 150 and 350 base pairs apart.

- Alternative amplification methods include: self sustained sequence
25 replication (Guatelli, J. C. et al., 1990, Proc. Natl. Acad. Sci. U.S.A. 87:1874-1878), transcriptional amplification system (Kwoh, D. Y. et al., 1989, Proc. Natl. Acad. Sci. U.S.A. 86:1173-1177), Q-Beta Replicase (Lizardi, P. M. et al., 1988, Bio/Technology 6:1197), or any other nucleic acid amplification
30 method, followed by the detection of the amplified molecules using techniques well known to those of skill in the art. These detection schemes are especially

-23-

useful for the detection of nucleic acid molecules if such molecules are present in very low numbers.

- Nucleic acids can also be analyzed by detection methods and protocols, particularly those that rely on mass spectrometry (see, *e.g.*, U.S. Patent No. 5,605,798, 6,043,031, allowed copending U.S. application Serial No. 08/744,481, U.S. application Serial No. 08/990,851 and International PCT application No. WO 99/31273, International PCT application No. WO 98/20019). These methods can be automated (see, *e.g.*, copending U.S. application Serial No. 09/285,481 and published International PCT application No. PCT/US00/08111, which describes an automated process line). Preferred among the methods of analysis herein are those involving the primer oligo base extension (PROBE) reaction with mass spectrometry for detection (described herein and elsewhere, see *e.g.*, U.S. Patent No. 6,043,031; see, also U.S. application Serial Nos. 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Serial No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Serial Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 08/933,792, 08/746,055, 08/786,988 and 08/787,639; see, also U.S. application Serial No. 09/074,936, U.S. Patent No. 6,024,925, and U.S. application Serial Nos. 08/746,055 and 08/786,988, and published International PCT application No. WO 98/20020)

- A preferred format for performing the analyses is a chip based format in which the biopolymer is linked to a solid support, such as a silicon or silicon-coated substrate, preferably in the form of an array. More preferably, when analyses are performed using mass spectrometry, particularly MALDI, small nanoliter volumes of sample are loaded on, such that the resulting spot is about, or smaller than, the size of the laser spot. It has been found that when this is achieved, the results from the mass spectrometric analysis are quantitative. The area under the signals in the resulting mass spectra are proportional to concentration (when normalized and corrected for background). Methods for preparing and using such chips are described in U.S. Patent No. 6,024,925, co-

-24-

pending U.S. application Serial Nos. 08/786,988, 09/364,774, 09/371,150 and 09/297,575; see, also U.S. application Serial No. PCT/US97/20195, which published as WO 98/20020. Chips and kits for performing these analyses are commercially available from SEQUENOM under the trademark MassARRAY.

5 MassArray relies on the fidelity of the enzymatic primer extension reactions combined with the miniaturized array and MALDI-TOF (Matrix-Assisted Laser Desorption Ionization-Time of Flight) mass spectrometry to deliver results rapidly. It accurately distinguishes single base changes in the size of DNA fragments associated with genetic variants without tags.

10 The methods provided herein permit quantitative determination of alleles. The areas under the signals in the mass spectra can be used for quantitative determinations. The frequency is determined from the ratio of the signal to the total area of all of the spectrum and corrected for background. This is possible because of the PROBE technology as described in the above applications

15 incorporated by reference herein.

Additional methods of analyzing nucleic acids include amplification- based methods including polymerase chain reaction (PCR), ligase chain reaction (LCR), mini-PCR, rolling circle amplification, autocatalytic methods, such as those using Q β replicase, TAS, 3SR, and any other suitable method known to those of skill

20 in the art.

Other methods for analysis and identification and detection of polymorphisms, include but are not limited to, allele specific probes, Southern analyses, and other such analyses.

The methods described below provide ways to fragment given amplified or non-amplified nucleotide sequences thereby producing a set of mass signals when mass spectrometry is used to analyze the fragment mixtures.

25 Amplified fragments are yielded by standard polymerase chain methods (US 4,683,195 and 4,683,202). The fragmentation method involves the use of enzymes that cleave single or double strands of DNA and enzymes that ligate DNA. The cleavage enzymes can be glycosylases, nickases, and site-specific and non site-specific nucleases with the most preferred enzymes being glycosylases, nickases, and site-specific nucleases.

30

-25-

Glycosylase Fragmentation Method

DNA glycosylases specifically remove a certain type of nucleobase from a given DNA fragment. These enzymes can thereby produce abasic sites, which can be recognized either by another cleavage enzyme, cleaving the exposed
5 phosphate backbone specifically at the abasic site and producing a set of nucleobase specific fragments indicative of the sequence, or by chemical means, such as alkaline solutions and or heat. The use of one combination of a DNA glycosylase and its targeted nucleotide would be sufficient to generate a base specific signature pattern of any given target region.

10 Numerous DNA glycosylases are known. For example, a DNA glycosylase can be uracil-DNA glycosylase (UDG), 3-methyladenine DNA glycosylase, 3-methyladenine DNA glycosylase II, pyrimidine hydrate-DNA glycosylase, FaPy-DNA glycosylase, thymine mismatch-DNA glycosylase, hypoxanthine-DNA glycosylase, 5-Hydroxymethyluracil DNA glycosylase (HmUDG), 5-
15 Hydroxymethylcytosine DNA glycosylase, or 1,N6-etheno-adenine DNA glycosylase (see, *e.g.*, U.S. Patent Nos. 5,536,649, 5,888, 795, 5,952,176 and 6,099,553, International PCT application Nos. WO 97/03210, WO 99/54501; see, also, Eftedal et al. (1993) Nucleic Acids Res 21:2095-2101, Bjelland and Seeberg (1987) Nucleic Acids Res. 15:2787-2801, Saparbaev et al.
20 (1995) Nucleic Acids Res. 23:3750-3755, Bessho (1999) Nucleic Acids Res. 27:979-983) corresponding to the enzyme's modified nucleotide or nucleotide analog target. A preferred glycosylase is uracil-DNA glycosylase (UDG).

Uracil, for example, can be incorporated into an amplified DNA molecule by amplifying the DNA in the presence of normal DNA precursor nucleotides
25 (e.g. dCTP, dATP, and dGTP) and dUTP. When the amplified product is treated with UDG, uracil residues are cleaved. Subsequent chemical treatment of the products from the UDG reaction results in the cleavage of the phosphate backbone and the generation of nucleobase specific fragments. Moreover, the separation of the complementary strands of the amplified product prior to
30 glycosylase treatment allows complementary patterns of fragmentation to be generated. Thus, the use of dUTP and Uracil DNA glycosylase allows the generation of T specific fragments for the complementary strands, thus providing

-26-

information on the T as well as the A positions within a given sequence. Similar to this, a C-specific reaction on both (complementary) strands (i.e. with a C-specific glycosylase) yields information on C as well as G positions within a given sequence if the fragmentation patterns of both amplification strands are
5 analyzed separately. Thus, with the glycosylase method and mass spectrometry, a full series of A, C, G and T specific fragmentation patterns can be analyzed.

Nickase Fragmentation Method

A DNA nickase, or DNase, can be used recognize and cleave one strand
10 of a DNA duplex. Numerous nickases are known. Among these, for example, are nickase NY2A nickase and NYS1 nickase (Megabase) with the following cleavage sites:

NY2A: 5'...R AG...3'

3'...Y TC...5' where R = A or G and Y = C or T

15 NYS1: 5'... CC[A/G/T]...3'

3'... GG[T/C/A]...5'.

Fen-Ligase Fragmentation Method

The Fen-ligase method involves two enzymes: Fen-1 enzyme and a ligase. The Fen-1 enzyme is a site-specific nuclease known as a "flap" endonuclease
20 (US 5,843,669, 5,874,283, and 6,090,606). This enzymes recognizes and cleaves DNA "flaps" created by the overlap of two oligonucleotides hybridized to a target DNA strand. This cleavage is highly specific and can recognize single base pair mutations, permitting detection of a single homologue from an individual heterozygous at one SNP of interest and then genotyping that
25 homologue at other SNPs occurring within the fragment. Fen-1 enzymes can be Fen-1 like nucleases e.g. human, murine, and *Xenopus* XPG enzymes and yeast RAD2 nucleases or Fen-1 endonucleases from, for example, *M. jannaschii*, *P. furiosus*, and *P. woesei*. Among preferred enzymes are the Fen-1 enzymes.

The ligase enzyme forms a phosphodiester bond between two double
30 stranded nucleic acid fragments. The ligase can be DNA Ligase I or DNA Ligase III (see, e.g., U.S. Patent Nos. US 5,506,137, 5,700,672, 5,858,705 and 5,976,806; see, also, Waga, *et al.* (1994) J. Biol. Chem. 269:10923-10934, Li

-27-

et al. (1994) Nucleic Acids Res. 22:632-638, Arrand et al. (1986) J. Biol. Chem. 261:9079-9082, Lehman (1974) Science 186:790-797, Higgins and Cozzarelli (1979) Methods Enzymol. 68:50-71, Lasko et al. (1990) Mutation Res. 236:277-287, and Lindahl and Barnes (1992) Ann. Rev. Biochem. 61:251-281).

- 5 Thermostable ligase (Epicenter Technologies), where "thermostable" denotes that the ligase retains activity even after exposure to temperatures necessary to separate two strands of DNA, are among preferred ligases for use herein.

Type IIS Enzyme Fragmentation Method

- 10 Restriction enzymes bind specifically to and cleave double-stranded DNA at specific sites within or adjacent to a particular recognition sequence. These enzymes have been classified into three groups (e.g. Types I, II, and III) as known to those of skill in the art. Because of the properties of type I and type III enzymes, they have not been widely used in molecular biological applications.
- 15 Thus, for this invention type II enzymes are preferred. Of the thousands of restriction enzymes known in the arts, there are 179 different type II specificities. Of the 179 unique type II restriction endonucleases, 31 have a 4-base recognition sequence, 11 have a 5-base recognition sequence, 127 have a 6-base recognition sequence, and 10 have recognition sequences of greater than
- 20 six bases (US 5,604,098). Of category type II enzymes, type IIS is preferred.

 Type IIS enzymes can be *Alw* XI, *Bbv* I, *Bce* 83, *Bpm* I, *Bsg* I, *Bsm* AI, *Bsm* FI, *Bsa* I, *Bcc* I, *Bcg* I, *Ear* I, *Eco* 57I, *Esp* 3I, *Fau* I, *Fok* I, *Gsu* I, *Hga* I, *Mme* I, *Mbo* II, *Sap* I, and the like. The preferred type IIS enzyme is *Fok* I.

- The *Fok* I enzyme endonuclease is an exemplary well characterized
- 25 member of the Type IIS class (see, e.g., U.S. Patent Nos. 5,714,330, 5,604,098, 5,436,150, 6,054,276 and 5,871,911; see, also, Szybalski et al. (1991) Gene 100:13-26, Wilson and Murray (1991) Ann. Rev. Genet. 25:585-627, Sugisaki et al. (1981) Gene 16:73-78, Podhajski and Szalski (1985) Gene 40:175-182. *Fok* I recognizes the sequence 5'GGATG-3' and cleaves DNA
- 30 accordingly. Type IIS restriction sites can be introduced into DNA targets by incorporating the site into primers used to amplify such targets. Fragments produced by digestion with *Fok* I are site specific and can be analyzed by mass

-28-

spectrometry methods such as MALDI-TOF mass spectrometry, ESI-TOF mass spectrometry, and any other type of mass spectrometry well known to those of skill in the art.

- Once a polymorphism has been found to correlate with a parameter
5 such as age. The possibility of false results due to allelic dropout is examined by doing comparative PCR in an adjacent region of the genome.

Analyses

- In using the database, allelic frequencies can be determined across the population by analyzing each sample in the population individually, determining
10 the presence or absence of allele or marker of interest in each individual sample, and then determining the frequency of the marker in the population. The database can then be sorted (stratified) to identify any correlations between the allele and a selected parameter using standard statistical analysis. If a correlation is observed, such as a decrease in a particular marker with age or
15 correlation with sex or other parameter, then the marker is a candidate for further study, such as genetic mapping to identify a gene or pathway in which it is involved. The marker may then be correlated, for example, with a disease. Haplotyping can also be carried out. Genetic mapping can be effected using standard methods and may also require use of databases of others, such as
20 databases previously determined to be associated with a disorder.

Exemplary analyses have been performed and these are shown in the figures, and discussed herein.

Sample pooling

- It has been found that using the databases provided herein, or any other
25 database of such information, substantially the same frequencies that were obtained by examining each sample separately can be obtained by pooling samples, such as in batches of 10, 20, 50, 100, 200, 500, 1000 or any other number. A precise number may be determined empirically if necessary, and can be as low as 3.

-29-

In one embodiment, the frequency of genotypic and other markers can be obtained by pooling samples. To do this a target population and a genetic variation to be assessed is selected, a plurality of samples of biopolymers are obtained from members of the population, and the biopolymer from which the
5 marker or genotype can be inferred is determined or detected. A comparison of samples tested in pools and individually and the sorted results therefrom are shown in Figure 9, which shows frequency of the factor VII Allele 353Q. Figure 10 depicts the frequency of the CETP Allele CETP in pooled versus individual samples. Figure 15 shows ethnic diversity among various ethnic groups in the
10 database using pooled DNA samples to obtain the data. Figures 12-14 show mass spectra for these samples.

Pooling of test samples has application not only to the healthy databases provided herein, but also to use in gathering data for entry into any database of subjects and genotypic information, including typical databases derived from
15 diseased populations. What is demonstrated herein, is the finding that the results achieved are statistically the same as the results that would be achieved if each sample is analyzed separately. Analysis of pooled samples by a method, such as the mass spectrometric methods provided herein, permits resolution of such data and quantitation of the results.

20 For factor VII the R53Q acid polymorphism was assessed. In Figure 9, the "individual" data represent allelic frequency observed in 92 individuals reactions. The pooled data represent the allelic frequency of the same 92 individuals pooled into a single probe reaction. The concentration of DNA in the samples of individual donors is 250 nanograms. The total concentration of DNA
25 in the pooled samples is also 250 nanograms, where the concentration of any individual DNA is 2.7 nanograms.

It also was shown that it is possible to reduce the DNA concentration of individuals in a pooled samples from 2.7 nanograms to 0.27 nanograms without any change in the quality of the spectrum or the ability to quantitate the amount
30 of sample detected. Hence low concentrations of sample may be used in the pooling methods.

-30-

Use of the databases and markers identified thereby

The successful use of genomics requires a scientific hypothesis (*i.e.*, common genetic variation, such as a SNP), a study design (*i.e.*, complex disorders), samples and technology, such as the chip-based mass spectrometric analyses (see, *e.g.*, U.S. Patent No. 5,605,798, U.S. Patent No. 5,777,324, 5 U.S. Patent No. 6,043,031, allowed copending U.S. application Serial No. 08/744,481, U.S. application Serial No. 08/990,851, International PCT application No. WO 98/20019, copending U.S. application Serial No. 09/285,481, which describes an automated process line for analyses; see, also, 10 U.S. application Serial Nos. 08/617,256, 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Serial No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Serial Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 15 08/933,792, 08/746,055, 09/266,409, 08/786,988 and 08/787,639; see, also U.S. application Serial No. 09/074,936). All of these aspects can be used in conjunction with the databases provided herein and samples in the collection.

The databases and markers identified thereby can be used, for example, for identification of previously unidentified or unknown genetic markers and to 20 identify new uses for known markers. As markers are identified, these may be entered into the database to use as sorting parameters from which additional correlations may be determined.

Previously unidentified or unknown genetic markers

The samples in the healthy databases can be used to identify new 25 polymorphisms and genetic markers, using any mapping, sequencing, amplification and other methodologies, and in looking for polymorphisms among the population in the database. The thus-identified polymorphism can then be entered into the database for each sample, and the database sorted (stratified) using that polymorphism as a sorting parameter to identify any patterns and 30 correlations that emerge, such as age correlated changes in the frequency of the identified marker. If a correlation is identified, the locus of the marker can be mapped and its function or effect assessed or deduced.

-31-

Thus, the databases here provide means for:

- identification of significantly different allelic frequencies of genetic factors by comparing the occurrence or disappearance of the markers with increasing age in population and then associating the markers with a disease or a
5 biochemical pathway;
- identification of significantly different allelic frequencies of disease causing genetic factors by comparing the male with the female population or comparing other selected stratified populations and associating the markers with a disease or a biochemical pathway;
- 10 identification of significantly different allelic frequencies of disease causing genetic factors by comparing different ethnic groups and associating the markers with a disease or a biochemical pathway that is known to occur in high frequency in the ethnic group;
- profiling potentially functional variants of genes through the general
15 panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating the contribution of the variant genes to the physical condition of the investigated population;
- identification of functionally relevant gene variants by gene disequilibrium analysis performed within the general panmixed population stratified according
20 to age, sex, and ethnic origin and thereby demonstrating their contribution to the physical condition of investigated population;
- identification of potentially functional variants of chromosomes or parts of chromosomes by linkage disequilibrium analysis performed within the general panmixed population stratified according to age, sex, and ethnic origin and
25 thereby demonstrating their contribution to the physical condition of investigated population.

Uses of the identified markers and known markers

- The databases may also be used in conjunction with known markers and sorted to identify any correlations. For example, the databases can be used for:
- 30 determination and evaluation of the penetrance of medically relevant polymorphic markers;

-32-

determination and evaluation of the diagnostic specificity of medically relevant genetic factors;

determination and evaluation of the positive predictive value of medically relevant genetic factors;

5 determination and evaluation of the onset of complex diseases, such as, but are not limited to, diabetes, hypertension, autoimmune diseases, arteriosclerosis, cancer and other diseases within the general population with respect to their causative genetic factors;

delineation of the appropriate strategies for preventive disease treatment;

10 delineation of appropriate timelines for primary disease intervention;

validation of medically relevant genetic factors identified in isolated populations regarding their general applicability;

validation of disease pathways including all potential target structures identified in isolated populations regarding their general applicability; and

15 validation of appropriate drug targets identified in isolated populations regarding their general applicability.

Among the diseases and disorders for which polymorphisms may be linked include, those linked to inborn errors of metabolism, acquired metabolic disorders, intermediary metabolism, oncogenesis pathways, blood clotting

20 pathways, and DNA synthetic and repair pathways DNA

repair/replication/transcription factors and activities, *e.g.*, such as genes related to oncogenesis, aging and genes involved in blood clotting and the related biochemical pathways that are related to thrombosis, embolism, stroke, myocardial infarction, angiogenesis and oncogenesis.

25 For example, a number of diseases are caused by or involve deficient or defective enzymes in intermediary metabolism (see, e.g., Tables 1 and 2, below) that result, upon ingestion of the enzyme substrates, in accumulation of harmful metabolites that damage organs and tissues, particularly an infant's developing brain and other organs, resulting in mental retardation and other developmental
30 disorders.

-33-

Identification of markers and genes for such disorders is of great interest.

Model systems

Several gene systems, p21, p53 and Lipoprotein Lipase polymorphism (N291S), were selected. The p53 gene is a tumor suppressor gene that is
5 mutated in diverse tumor types. One common allelic variant occurs at codon 72. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in an amino acid exchange, arginine to proline, at codon 72 of the gene.

Using diseased populations, it has been shown that there are ethnic differences in the allelic distribution of these alleles among African-Americans
10 and Caucasians in the U.S. The results here support this finding and also demonstrate that the results obtained with a healthy database are meaningful (see, Figure 7B).

The 291S allele leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for
15 arteriosclerosis and in particular myocardial infarction (see, Reymer *et al.* (1995) *Nature Genetics* 10:28-34).

Both genetic polymorphisms were profiled within a part of the Caucasian population-based sample bank. For the polymorphism located in the lipoprotein lipase gene a total of 1025 unselected individuals (436 males and 589 females)
20 were tested. Genomic DNA was isolated from blood samples obtained from the individuals.

As shown in the Examples and figures, an exemplary database containing about 5000 subjects, answers to the questionnaire (see Figure 3), and genotypic information has been stratified. A particular known allele has been selected, and
25 the samples tested for the marker using mass spectrometric analyses, particularly PROBE (see the EXAMPLES) to identify polymorphisms in each sample. The population in the database has been sorted according to various parameters and correlations have been observed. For example, FIGURES 2A-C, show sorting of the data by age and sex for the Lipoprotein Lipase gene in the
30 Caucasian population in the database. The results show a decrease in the frequency of the allele with age in males but no such decrease in females. Other

-34-

alleles that have been tested against the database, include, alleles of p53, p21 and factor VII. Results when sorted by age are shown in the figures.

These examples demonstrate an effect of altered frequency of disease causing genetic factors within the general population. The scientific
5 interpretation of those results allows prediction of medical relevance of polymorphic genetic alterations. In addition, conclusions can be drawn with regard to their penetrance, diagnostic specificity, positive predictive value, onset of disease, most appropriate onset of preventive strategies, and the general applicability of genetic alterations identified in isolated populations to panmixed
10 populations.

Therefore, an age- and sex-stratified population-based sample bank that is ethnically homogenous is a suitable tool for rapid identification and validation of genetic factors regarding their potential medical utility.

15 **Exemplary computer system for creating, storing and processing the databases Systems**

Systems, including computers, containing the databases are provided herein. The computers and databases can be used in conjunction, for example, with the APL system (see, copending U.S. application Serial No. 09/285,481),
20 which is an automated system for analyzing biopolymers, particularly nucleic acids. Results from the APL system can be entered into the database.

Any suitable computer system may be used. The computer system may be integrated into systems for sample analysis, such as the automated process line described herein (see, *e.g.*, copending U.S. application Serial No.
25 09/285,481).

Figure 17 is a block diagram of a computer constructed in to provide and process the databases described herein. The processing that maintains the database and performs the methods and procedures may be performed on multiple computers all having a similar construction, or may be performed by a
30 single, integrated computer. For example, the computer through which data is added to the database may be separate from the computer through which the database is sorted, or may be integrated with it. In either arrangement, the

-35-

computers performing the processing may have a construction as illustrated in Figure 17.

Figure 17 is a block diagram of an exemplary computer 1700 that maintains the database described above and performs the methods and

5 procedures. Each computer 1700 operates under control of a central processor unit (CPU) 1702, such as a "Pentium" microprocessor and associated integrated circuit chips, available from Intel Corporation of Santa Clara, California, USA. A computer user can input commands and data from a keyboard and display mouse 1704 and can view inputs and computer output at a display 1706. The

10 display is typically a video monitor or flat panel display device. The computer 1700 also includes a direct access storage device (DASD) 1707, such as a fixed hard disk drive. The memory 1708 typically comprises volatile semiconductor random access memory (RAM). Each computer preferably includes a program product reader 1710 that accepts a program product storage device 1712, from

15 which the program product reader can read data (and to which it can optionally write data). The program product reader can comprise, for example, a disk drive, and the program product storage device can comprise removable storage media such as a magnetic floppy disk, an optical CD-ROM disc, a CD-R disc, a CD-RW disc, or a DVD data disc. If desired, the computers can be connected so

20 they can communicate with each other, and with other connected computers, over a network 1713. Each computer 1700 can communicate with the other connected computers over the network 1713 through a network interface 1714, that enables communication over a connection 1716 between the network and the computer.

25 The computer 1700 operates under control of programming steps that are temporarily stored in the memory 1708 in accordance with conventional computer construction. When the programming steps are executed by the CPU 1702, the pertinent system components perform their respective functions. Thus, the programming steps implement the functionality of the system as

30 described above. The programming steps can be received from the DASD 1707, through the program product reader 1712, or through the network connection 1716. The storage drive 1710 can receive a program product, read

-36-

programming steps recorded thereon and transfer the programming steps into the memory 1708 for execution by the CPU 1702. As noted above, the program product storage device 1710 can comprise any one of multiple removable media having recorded computer-readable instructions, including
5 magnetic floppy disks and CD-ROM storage discs. Other suitable program product storage devices can include magnetic tape and semiconductor memory chips. In this way, the processing steps necessary for operation can be embodied on a program product.

Alternatively, the program steps can be received into the operating
10 memory 1708 over the network 1713. In the network method, the computer receives data including program steps into the memory 1708 through the network interface 1714 after network communication has been established over the network connection 1716 by well-known methods that will be understood by those skilled in the art without further explanation. The program steps are then
15 executed by the CPU 1702 to implement the processing of the Garment Database system.

It should be understood that all of the computers of the system preferably have a construction similar to that shown in Figure 17, so that details described with respect to the Figure 17 computer 1700 will be understood to apply to all
20 computers of the system 1700. This is indicated by multiple computers 1700 shown connected to the network 1713. Any one of the computers 1700 can have an alternative construction, so long as they can communicate with the other computers and support the functionality described herein.

Figure 18 is a flow diagram that illustrates the processing steps
25 performed using the computer illustrated in Figure 17, to maintain and provide access to the databases, such as for identifying polymorphic genetic markers. In particular, the information contained in the database is stored in computers having a construction similar to that illustrated in Figure 17. The first step for maintaining the database, as indicated in Figure 18, is to identify healthy
30 members of a population. As noted above, the population members are subjects that are selected only on the basis of being healthy, and where the subjects are mammals, such as humans, they are preferably selected based upon apparent

-37-

health and the absence of detectable infections. The step of identifying is represented by the flow diagram box numbered 1802.

The next step, represented by the flow diagram box numbered 1804, is to obtain identifying and historical information and data relating to the identified
5 members of the population. The information and data comprise parameters for each of the population members, such as member age, ethnicity, sex, medical history, and ultimately genotypic information. Initially, the parameter information is obtained from a questionnaire answered by each member, from whom a body tissue or body fluid sample also is obtained. The step of entering and storing
10 these parameters into the database of the computer is represented by the flow diagram box numbered 1806. As additional information about each population member and corresponding sample is obtained, this information can be inputted into the database and can serve as a sorting parameter.

In the next step, represented by the flow diagram box numbered 1808,
15 the parameters of the members are associated with an indexer. This step may be executed as part of the database storage operation, such as when a new data record is stored according to the relational database structure and is automatically linked with other records according to that structure. The step 1806 also may be executed as part of a conventional data sorting or retrieval
20 process, in which the database entries are searched according to an input search or indexing key value to determine attributes of the data. For example, such search and sort techniques may be used to follow the occurrence of known genetic markers and then determine if there is a correlation with diseases for which they have been implicated. Examples of this use are for assessing the
25 frequencies of the p53 and Lipoprotein Lipase polymorphisms.

Such searching of the database also may be valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex, or some other criteria. This can allow the identification of previously unknown polymorphisms and, ultimately,
30 identification of a gene or pathway involved in the onset and progression of disease.

-38-

In addition, the database can be used for taking an identified polymorphism and ascertaining whether it changes in frequency when the data is sorted according to a selected parameter.

In this way, the databases and methods provided herein permit, among
5 other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings, and also an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new
10 potential drug targets, and in identifying new drug candidates.

Morbidity and/or early mortality associated polymorphisms

A database containing information provided by a population of healthy blood donors who were not selected for any particular disease to can be used to identify polymorphisms and the alleles in which they are present, whose
15 frequency decreases with age. These may represent morbidity susceptibility markers and genes.

Polymorphisms of the genome can lead to altered gene function, protein function or genome instability. To identify those polymorphisms which have a clinical relevance/utility is the goal of a world-wide scientific effort. It can be
20 expected that the discovery of such polymorphisms will have a fundamental impact on the identification and development of novel drug compounds to cure diseases. However, the strategy to identify valuable polymorphisms is cumbersome and dependent upon the availability of many large patient and control cohorts to show disease association. In particular, genes that cause a
25 general risk of the population to suffer from any disease (morbidity susceptibility genes) will escape these case/control studies entirely.

Here described is a screening strategy to identify morbidity susceptibility genes underlying a variety of different diseases. The definition of a morbidity susceptibility gene is a gene that is expressed in many different cell types or
30 tissues (housekeeping gene) and its altered function can facilitate the expression of a clinical phenotype caused by disease-specific susceptibility genes that are involved in a pathway specific for this disorder. In other words, these morbidity

-39-

susceptibility genes predispose people to develop a distinct disease according to their genetic make-up for this disease.

Candidates for morbidity susceptibility genes can be found at the bottom level of pathways involving transcription, translation, heat-shock proteins, protein trafficking, DNA repair, assembly systems for subcellular structures (e.g. mitochondria, peroxysomes and other cellular microbodies), receptor signaling cascades, immunology, etc. Those pathways control the quality of life at the cellular level as well as for the entire organism. Mutations/polymorphisms located in genes encoding proteins for those pathways can reduce the fitness of cells and make the organism more susceptible to express the clinical phenotype caused by the action of a disease-specific susceptibility gene. Therefore, these morbidity susceptibility genes can be potentially involved in a whole variety of different complex diseases if not in all. Disease-specific susceptibility genes are involved in pathways that can be considered as disease-specific pathways like glucose-, lipid, hormone metabolism, etc.

The exemplified method permit, among other things, identification of genes and/or gene products involved in a man's general susceptibility to morbidity and/or mortality; use of these genes and/or gene products in studies to elucidate the genetic underpinnings of human diseases; use of these genes and/or gene products in combinatorial statistical analyses without or together with disease-specific susceptibility genes; use of these genes and/or gene products to predict penetrance of disease susceptibility genes; use of these genes and/or gene products in predisposition and/or acute medical diagnostics and use of these genes and/or gene products to develop drugs to cure diseases and/or to extend the life span of humans.

SCREENING PROCESS

The healthy population stratified by age, gender and ethnicity, etc. is a very efficient and a universal screening tool for morbidity associated genes. Changes of allelic frequencies in the young compared to the old population are expected to indicate putative morbidity susceptibility genes. Individual samples of this healthy population base can be pooled to further increase the throughput. In a proof of principle experiment pools of young and old Caucasian females and

-40-

males were applied to screen more than 400 randomly chosen single nucleotide polymorphisms located in many different genes. Candidate polymorphisms were identified if the allelic difference was greater than 8% between young and old for both or only one of the genders. The initial results were assayed again in at least one independent subsequent experiments. Repeated experiments are necessary to recognize unstable biochemical reactions, which occur with a frequency of about 2-3% and can mimic age-related allelic frequency differences. Average frequency differences and standard deviations are calculated after successful reproducibility of initial results. The final allelic frequency is then compared to a reference population of Caucasian CEPH sample pool. The result should show similar allelic frequencies in the young Caucasian population. Subsequently, the exact allele frequencies of candidates including genotype information were obtained by analyzing all individual samples. This procedure is straight forward with regard to time and cost. It enables the screening of an enormous number of SNPs. So far, several markers with a highly significant association to age were identified and described below.

In general at least 5 individual in a stratified population need to be screened to produce statistically significant results. The frequency of the allele is determined for an age stratified population. Chi square analysis is then performed on the allelic frequencies to determine if the difference between age groups is statistically significant. A p value less than of 0.1 is considered to represent a statistically significant difference. More preferably the p value should be less than 0.05.

Clinical Trials

The identification of markers whose frequency in a population decreases with age also allows for better designed and balanced clinical trials. Currently, if a clinical trial utilizes a marker as a significant endpoint in a study and the marker disappears with age, then the results of the study may be inaccurate. By using methods provided herein, it can be ascertained that if a marker decreases in frequency with age. This information considered and controlled when designing the study. For, example, an age independent marker could be substituted in its place.

-41-

The following examples are included for illustrative purposes only and are not intended to limit the scope of the invention.

EXAMPLE 1

This example describes the use of a database containing information
5 provided by a population of healthy blood donors who were not selected for any particular disease to determine the distribution of allelic frequencies of known genetic markers with age and by sex in a Caucasian subpopulation of the database. The results described in this example demonstrate that a disease-related genetic marker or polymorphism can be identified by sorting a healthy
10 database by a parameter or parameters, such as age, sex and ethnicity.

Generating a database

Blood was obtained by venous puncture from human subjects who met blood bank criteria for donating blood. The blood samples were preserved with EDTA at pH 8.0 and labeled. Each donor provided information such as age, sex,
15 ethnicity, medical history and family medical history. Each sample was labeled with a barcode representing identifying information. A database was generated by entering, for each donor, the subject identifier and information corresponding to that subject into the memory of a computer storage medium using commercially available software, e.g., Microsoft Access.

20 Model genetic markers

The frequencies of polymorphisms known to be associated at some level with disease were determined in a subpopulation of the subjects represented in the database. These known polymorphisms occur in the p21, p53 and Lipoprotein Lipase genes. Specifically, the N291S polymorphism (N291S) of the
25 Lipoprotein Lipase gene, which results in a substitution of a serine for an asparagine at amino acid codon 291, leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for arteriosclerosis and in particular myocardial infarction (see, Reymer *et al.* (1995) *Nature Genetics* 10:28-34).

30 The p53 gene encodes a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulating genes that control cell growth, DNA repair and apoptosis (programmed cell death). Mutations in the

-42-

p53 gene have been found in a wide variety of different cancers, including different types of leukemia, with varying frequency. The loss of normal p53 function results in genomic instability and uncontrolled cell growth. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in the substitution of a proline for an arginine at amino acid codon 72 of the gene.

The p21 gene encodes a cyclin-dependent kinase inhibitor associated with G1 phase arrest of normal cells. Expression of the p21 gene triggers apoptosis. Polymorphisms of the p21 gene have been associated with Wilms' tumor, a pediatric kidney cancer. One polymorphism of the p21 gene, the S31R polymorphism, results in a substitution of an arginine for a serine at amino acid codon 31.

Database analysis

Sorting of subjects according to specific parameters

The genetic polymorphisms were profiled within segments of the Caucasian subpopulation of the sample bank. For p53 profiling, the genomic DNA isolated from blood from a total of 1277 Caucasian subjects age 18-59 years and 457 Caucasian subjects age 60-79 years was analyzed. For p21 profiling, the genomic DNA isolated from blood from a total of 910 Caucasian subjects age 18-49 years and 824 Caucasian subjects age 50-79 years was analyzed. For lipoprotein lipase gene profiling, the genomic DNA from a total of 1464 Caucasian females and 1470 Caucasian males under 60 years of age and a total of 478 Caucasian females and 560 Caucasian males over 60 years of age was analyzed.

Isolation and analysis of genomic DNA

Genomic DNA was isolated from blood samples obtained from the individuals. Ten milliliters of whole blood from each individual was centrifuged at 2000 x g. One milliliter of the buffy coat was added to 9 ml of 155 mM NH_4Cl , 10 mM KHCO_3 , and 0.1 mM Na_2EDTA , incubated 10 min at room temperature and centrifuged for 10 min at 2000 x g. The supernatant was removed, and the white cell pellet was washed in 155 mM NH_4Cl , 10 mM KHCO_3 and 0.1 mM Na_2EDTA and resuspended in 4.5 ml of 50 mM Tris, 5 mM

-43-

EDTA and 1% SDS. Proteins were precipitated from the cell lysate by 6 mM ammonium acetate, pH 7.3, and then separated from the nucleic acids by centrifugation at 3000 x g. The nucleic acid was recovered from the supernatant by the addition of an equal volume of 100% isopropanol and
5 centrifugation at 2000 x g. The dried nucleic acid pellet was hydrated in 10 mM Tris, pH 7.6, and 1 mM Na₂EDTA and stored at 4° C.

Assays of the genomic DNA to determine the presence or absence of the known genetic markers were developed using the BiomassPROBE™ detection method (primer oligo base extension) reaction. This method uses a single
10 detection primer followed by an oligonucleotide extension step to give products, which can be readily resolved by mass spectrometry, and, in particular, MALDI-TOF mass spectrometry. The products differ in length depending on the presence or absence of a polymorphism. In this method, a detection primer anneals adjacent to the site of a variable nucleotide or sequence of nucleotides
15 and the primer is extended using a DNA polymerase in the presence of one or more dideoxynTPs and, optionally, one or more deoxyNTPs. The resulting products are resolved by MALDI-TOF mass spectrometry. The mass of the products as measured by MALDI-TOF mass spectrometry makes possible the determination of the nucleotide(s) present at the variable site.

20 First, each of the Caucasian genomic DNA samples was subjected to nucleic acid amplification using primers corresponding to sites 5' and 3' of the polymorphic sites of the p21 (S31R allele), p53 (R72P allele) and Lipoprotein Lipase (N291S allele) genes. One primer in each primer pair was biotinylated to permit immobilization of the amplification product to a solid support.
25 Specifically, the polymerase chain reaction primers used for amplification of the relevant segments of the p21, p53 and lipoprotein lipase genes are shown below: US4p21c31-2F (SEQ ID NO: 9) and US5p21-2R (SEQ ID NO: 10) for p21 gene amplification; US4-p53-ex4-F (also shown as p53-ex4US4 (SEQ ID NO: 2)) and US5-p53/2-4R (also shown as US5P53/4R (SEQ ID NO: 3)) for p53 gene
30 amplification; and US4-LPL-F2 (SEQ ID NO: 16) and US5-LPL-R2 (SEQ ID NO: 17) for lipoprotein lipase gene amplification.

-44-

Amplification of the respective DNA sequences was conducted according to standard protocols. For example, primers may be used in a concentration of 8 pmol. The reaction mixture (e.g., total volume 50 μ l) may contain Taq-polymerase including 10x buffer and dTNPs. Cycling conditions for
5 polymerase chain reaction amplification may typically be initially 5 min. at 95°C, followed by 1 min. at 94°C, 45 sec at 53°C, and 30 sec at 72°C for 40 cycles with a final extension time of 5 min at 72°C. Amplification products may be purified by using Qiagen's PCR purification kit (No. 28106) according to manufacturer's instructions. The elution of the purified products from the
10 column can be done in 50 μ l TE-buffer (10mM Tris, 1 mM EDTA, pH 7.5).

The purified amplification products were immobilized via a biotin-avidin linkage to streptavidin-coated beads and the double-stranded DNA was denatured. A detection primer was then annealed to the immobilized DNA using conditions such as, for example, the following: 50 μ l annealing buffer (20 mM
15 Tris, 10 mM KCl, 10 mM $(\text{NH}_4)_2\text{SO}_4$, 2 mM MgSO_4 , 1% Triton X-100, pH 8) at 50°C for 10 min, followed by washing of the beads three times with 200 μ l washing buffer (40 mM Tris, 1 mM EDTA, 50 mM NaCl, 0.1% Tween 20, pH 8.8) and once in 200 μ l TE buffer.

The PROBE extension reaction was performed, for example, by using
20 some components of the DNA sequencing kit from USB (No. 70770) and dNTPs or ddNTPs from Pharmacia. An exemplary protocol could include a total reaction volume of 45 μ l, containing of 21 μ l water, 6 μ l Sequenase-buffer, 3 μ l 10 mM DTT solution, 4.5 μ l, 0.5 mM of three dNTPs, 4.5 μ l, 2 mM the missing one ddNTP, 5.5 μ l glycerol enzyme dilution buffer, 0.25 μ l Sequenase 2.0, and 0.25
25 pyrophosphatase. The reaction can then be pipetted on ice and incubated for 15 min at room temperature and for 5 min at 37°C. The beads may be washed three times with 200 μ l washing buffer and once with 60 μ l of a 70 mM NH_4 -Citrate solution.

The DNA was denatured to release the extended primers from the
30 immobilized template. Each of the resulting extension products was separately analyzed by MALDI-TOF mass spectrometry using 3-hydroxypicolinic acid (3-HPA) as matrix and a UV laser.

-45-

Specifically, the primers used in the PROBE reactions are as shown below: P21/31-3 (SEQ ID NO: 12) for PROBE analysis of the p21 polymorphic site; P53/72 (SEQ ID NO: 4) for PROBE analysis of the p53 polymorphic site; and LPL-2 for PROBE analysis of the lipoprotein lipase gene polymorphic site. In the PROBE analysis of the p21 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 31 encodes a serine) and from the reaction conducted on a polymorphic S31R allele template (wherein codon 31 encodes an arginine) are shown below and designated as P21/31-3 Ser (wt) (SEQ ID NO: 13) and P21/31-3 Arg (SEQ ID NO: 14), respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 4900.2 Da for the wild-type product and 5213.4 Da for the polymorphic product).

In the PROBE analysis of the p53 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 72 encodes an arginine) and from the reaction conducted on a polymorphic R72P allele template (wherein codon 72 encodes a proline) are shown below and designated as Cod72 G Arg (wt) and Cod72 C Pro, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 5734.8 Da for the wild-type product and 5405.6 Da for the polymorphic product).

In the PROBE analysis of the lipoprotein lipase gene polymorphic site, the extension reaction was performed using a mixture of ddA and ddT. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 291 encodes an asparagine) and from the reaction conducted on a polymorphic N291S allele template (wherein codon 291 encodes a serine) are shown below and designated as 291Asn and 291Ser, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 6438.2 Da for the wild-type product and 6758.4 Da for the polymorphic product).

P53-1 (R72P)

-46-

PCR Product length: 407 bp (SEQ ID NO: 1)

US4-p53-ex4-F
 ctg aggacctggg cctctgactg
 5 ctcttttcac ccatctacag tcccccttgc cgtcccaagc aatggatgat ttgatgctgt
 ccccggaaga tattgaacaa tggttcactg aagaccagg tccagatgaa gctcccagaa
 P53/72 72R
 tggcagaaggc tactccccgc gtggcccctg caccagcagc tcctacaccg gcggcccctg
 c 72P
 10 caccagcccc ctctggccc ctgtcatctt ctgtcccttc ccagaaaacc taccagggca
 gctacgggtt ccgtctgggc ttcttgcat ctgggacagc caagtctgtg acttgacagg
 tcagttgcc tgaggggctg gcttccatga gacttcaa
 US5-p53/2-4R

Primers (SEQ ID NOs: 2-4)

p53-ex4FUS4 ccc agt cac gac qtt gta aaa cgc tga gga cct ggt cct ctg ac
 15 US5P53/4R agc gga taa caa ttt cac aca ggt tga agt ctc atg gaa gcc
 P53/72 gcc aga ggc tgc tcc cc

Masses

Allele	Product Termination: ddC	SEQ #	Length	Mass
P53/72	gccagaggctgctcccc	5	17	5132.4
20 Cod72 G Arg (wt)	gccagaggctgctccccgc	6	19	5734.8
Cod72 C Pro	gccagaggctgctcccc	7	18	5405.6

Biotinylated US5 primer is used in the PCR amplification.

LPL-1 (N291S)

25 Amino acid exchange asparagine to serine at codon 291 of the
 lipoprotein lipase gene.

PCR Product length: 251 bp (SEQ ID NO: 15)

US4-LPL-F2 (SEQ ID NO: 16)

30 gcgtccatt catctcttca tcgactctct gttgaatgaa gaaaatccaa gtaaggccta
 cagggtgcagt tccaaggaag cctttgagaa agggctctgc ttgagttgta gaaagaaccg
 LPL-2 291N
 ctgcaacaat ctgggctatg agatcaataa agtcagagcc aaaagaagca gcaaaatgta
 g 291S
 35 cctgaagact cgttctcaga tgccc
 US4-LPL-R2

Primers (SEQ ID NOs: 16-18):

US4-LPL-F2 ccc agt cac gac qtt gta aaa cgg cgc tcc att cat ctc ttc
 US5-LPL-R2 agc gga taa caa ttt cac aca ggg ggc atc tga gaa cga gtc
 LPL-2 caa tct ggg cta tga gat ca

-47-

Masses

Allele	Product Termination: ddA, ddT	SEQ #	Length	Mass
LPL-2	caatctgggctatgagatca	19	20	6141
291 Asn	caatctgggctatgagatcaa	20	21	6438.2
5 291 Ser	caatctgggctatgagatcagt	21	22	6758.4

Biotinylated US5 primer is used in the PCR amplification.

P21-1 (S31R)

- Amino acid exchange serine to arginine at codon 31 of the tumor suppressor gene p21. Product length: 207 bp (SEQ ID NO: 8)

US4p21c31-2F

- gtcc gtcagaaccc atgcggcagc
p21/31-3 31S
aaggcctgcc gccgcctctt cggcccagtg gacagcagc agctgagccg cgactgtgat
15 gcgctaattgg cgggctgcat ccaggaggcc cgtgagcgat ggaacttcga ctttgtcacc
gagacaccac tggaggg a 31R
US5p21-2R

Primers (SEQ ID NOs: 9-11)

- 20 US4p21c31-2F ccc agt cac gac gtt qta aaa cgg tcc gtc aga acc cat gcg g
US5p21-2R agc gga taa caa ttt cac aca ggc tcc agt ggt gtc tgg gtc ac
P21/31-3 cag cga gca gct gag

Masses

Allele	Product Termination: ddC	SEQ #	Length	Mass
25 p21/31-3	cagcgagcagctgag	12	15	4627
P21/31-3 Ser (wt)	cagcgagcagctgagc	13	16	4900.2
P21/31-3 Arg	cagcgagcagctgagac	14	17	5213.4

Biotinylated US5 primer is used in the PCR amplification.

- 30 Each of the Caucasian subject DNA samples was individually analyzed by MALDI-TOF mass spectrometry to determine the identity of the nucleotide at the polymorphic sites. The genotypic results of each assay can be entered into the database. The results were then sorted according to age and/or sex to determine the distribution of allelic frequencies by age and/or sex. As depicted in the Figures showing
- 35

-48-

histograms of the results, in each case, there was a differential distribution of the allelic frequencies of the genetic markers for the p21, p53 and lipoprotein lipase gene polymorphisms.

Figure 8 shows the results of the p21 genetic marker assays
5 reveals a statistically significant decrease (from 13.3% to 9.2%) in the frequency of the heterozygous genotype (S31R) in Caucasians with age (18-49 years of age compared to 50-79 years of age). The frequencies of the homozygous (S31 and R31) genotypes for the two age groups are also shown, as are the overall frequencies of the S31 and R31 alleles in
10 the two age groups (designated as *S31 and *R31, respectively in the Figure).

Figures 7A-C shows the results of the p53 genetic marker assays and reveals a statistically significant decrease (from 6.7% to 3.7%) in the frequency of the homozygous polymorphic genotype (P72) in Caucasians
15 with age (18-59 years of age compared to 60-79 years of age). The frequencies of the homozygous "wild-type" genotype (R72) and the heterozygous genotype (R72P) for the two age groups are also shown, as are the overall frequencies of the R72 and P72 alleles in the two age groups (designated as *R72 and *P72, respectively in the Figure). These
20 results are consistent with the observation that allele is not benign, as p53 regulates expression of a second protein, p21, which inhibits cyclin-dependent kinases (CDKs) needed to drive cells through the cell-cycle (a mutation in either gene can disrupt the cell cycle leading to increased cell division).

25 Figure 2C shows the results of the lipoprotein lipase gene genetic marker assays reveals a statistically significant decrease (from 1.97% to 0.54%) in the frequency of the polymorphic allele (S291) in Caucasian males with age (see also Reymer *et al.* (1995) *Nature Genetics* 10:28-34).

-49-

The frequencies of this allele in Caucasian females of different age groups are also shown.

EXAMPLE 2

This example describes the use of MALDI-TOF mass spectrometry
5 to analyze DNA samples of a number of subjects as individual samples
and as pooled samples of multiple subjects to assess the presence or
absence of a polymorphic allele (the 353Q allele) of the Factor VII gene
and determine the frequency of the allele in the group of subjects. The
results of this study show that essentially the same allelic frequency can
10 be obtained by analyzing pooled DNA samples as by analyzing each
sample separately and thereby demonstrate the quantitative nature of
MALDI-TOF mass spectrometry in the analysis of nucleic acids.

Factor VII

Factor VII is a serine protease involved in the extrinsic blood
15 coagulation cascade. This factor is activated by thrombin and works with
tissue factor (Factor III) in the processing of Factor X to Factor Xa. There
is evidence that supports an association between polymorphisms in the
Factor VII gene and increased Factor VII activity which can result in an
elevated risk of ischemic cardiovascular disease, including myocardial
20 infarction. The polymorphism investigated in this study is R353Q (i.e., a
substitution of a glutamic acid residue for an arginine residue at codon
353 of the Factor VII gene) (see Table 5).

Analysis of DNA samples for the presence or absence of the 353Q allele of the Factor VII gene

25 Genomic DNA was isolated from separate blood samples obtained
from a large number of subjects divided into multiple groups of 92
subjects per group. Each sample of genomic DNA was analyzed using
the BiomassPROBE™ assay as described in Example 1 to determine the
30 presence or absence of the 353Q polymorphism of the Factor VII gene.

-50-

First, DNA from each sample was amplified in a polymerase chain reaction using primers F7-353FUS4 (SEQ ID NO: 24) and F7-353RUS5 (SEQ ID NO: 26) as shown below and using standard conditions, for example, as described in Example 1. One of the primers was biotinylated
5 to permit immobilization of the amplification product to a solid support. The purified amplification products were immobilized via a biotin-avidin linkage to streptavidin-coated beads and the double-stranded DNA was denatured. A detection primer was then annealed to the immobilized DNA using conditions such as, for example, described in Example 1. The
10 detection primer is shown as F7-353-P (SEQ ID NO: 27) below. The PROBE extension reaction was carried out using conditions, for example, such as those described in Example 1. The reaction was performed using ddG.

The DNA was denatured to release the extended primers from the
15 immobilized template. Each of the resulting extension products was separately analyzed by MALDI-TOF mass spectrometry. A matrix such as 3-hydroxypicolinic acid (3-HPA) and a UV laser could be used in the MALDI-TOF mass spectrometric analysis. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 353
20 encodes an arginine) and from the reaction conducted on a polymorphic 353Q allele template (wherein codon 353 encodes a glutamic acid) are shown below and designated as 353 CGG and 353 CAG, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 5646.8 Da for the wild-type product
25 and 5960 Da for the polymorphic product).

The MALDI-TOF mass spectrometric analyses of the PROBE reactions of each DNA sample were first conducted separately on each sample (250 nanograms total concentration of DNA per analysis). The allelic frequency of the 353Q polymorphism in the group of 92 subjects

-51-

was calculated based on the number of individual subjects in which it was detected.

Next, the samples from 92 subjects were pooled (250 nanograms total concentration of DNA in which the concentration of any individual DNA is 2.7 nanograms) and the pool of DNA was subjected to MALDI-TOF mass spectrometric analysis. The area under the signal corresponding to the mass of the 353Q polymorphism PROBE extension product in the resulting spectrum was integrated in order to quantitate the amount of DNA present. The ratio of this amount to total DNA was used to determine the allelic frequency of the 353Q polymorphism in the group of subjects. This type of individual sample vs. pooled sample analysis was repeated for numerous different groups of 92 different samples.

The frequencies calculated based on individual MALDI-TOF mass spectrometric analysis of the 92 separate samples of each group of 92 are compared to those calculated based on MALDI-TOF mass spectrometric analysis of pools of DNA from 92 samples in Figure 9. These comparisons are shown as "pairs" of bar graphs in the Figure, each pair being labeled as a separate "pool" number, e.g., P1, P16, P2, etc. Thus, for example, for P1, the allelic frequency of the polymorphism calculated by separate analysis of each of the 92 samples was 11.41% and the frequency calculated by analysis of a pool of all of the 92 DNA samples was 12.09%.

The similarity in frequencies calculated by analyzing separate DNA samples individually and by pooling the DNA samples demonstrates that it is possible, through the quantitative nature of MALDI-TOF mass spectrometry, to analyze pooled samples and obtain accurate frequency determinations. The ability to analyze pooled DNA samples significantly reduces the time and costs involved in the use of the non-selected, healthy databases as described herein. It has also been shown that it is

-52-

possible to decrease the DNA concentration of the individual samples in a pooled mixture from 2.7 nanograms to 0.27 nanograms without any change in the quality of the spectrum or the ability to quantitate the amount of sample detected.

5 Factor VII R353Q PROBE Assay

PROBE Assay for cod353 CGG>CAG (Arg>Gln), Exon 9 G>A.

PCR fragment: 134 bp (incl. US tags; SEQ ID Nos. 22 and 23)

Frequency of A allele: Europeans about 0.1, Japanese/Chinese about 0.03-0.05 (Thromb. Haemost. 1995, 73:617-22; Diabetologia 1998,

10 41:760-6):

F7-353FUS4>

1201 GTGCCGGCTA CTCGGATGGC AGCAAGGACT CCTGCAAGGG GGACAGTGGA
GGCCACATG

F7-353-P> A <F7-353RUS5

15 1261 CCACCCACTA CCGGGGCACG TGGTACCTGA CGGGCATCGT CAGCTGGGGC
CAGGGCTGCG

Primers (SEQ ID NOS: 24-26)

Tm^{9*}

F7-353FUS4 CCC AGT CAC GAC GTT GTA AAA CGA TGG CAG CAA GGA CTC CTG 64°C

F7-353-P CAC ATG CCA CCC ACT ACC

20 F7-353RUS5 AGC GGA TAA CAA TTT CAC ACA GGT GAC GAT GCC CGT CAG GTA C 64°C

Masses

Allele	Product Termination: ddG	SEQ #	Length	Mass
F7-353-P	atgccaccactacc	27	18	5333.6
353 CGG	cacatgccaccactaccg	28	19	5646.8
25 353 CAG	cacatgccaccactaccag	29	20	5960
US5-bio bio-	agcggataacaattcacacagg	30	23	7648.6

Conclusion

The above examples demonstrate an effect of altered frequency of
30 disease causing genetic factors within the general population.

Interpretation of those results allows prediction of the medical relevance of polymorphic genetic alterations. In addition, conclusions can be drawn with regard to their penetrance, diagnostic specificity, positive predictive value, onset of disease, most appropriate onset of preventive strategies,

-53-

and the general applicability of genetic alterations identified in isolated populations to panmixed populations. Therefore, an age- and sex-stratified population-based sample bank that is ethnically homogenous is a suitable tool for rapid identification and validation of genetic factors regarding their potential medical utility.

EXAMPLE 3

MORBIDITY AND MORTALITY MARKERS

Sample Band and Initial Screening

Healthy samples were obtained through the blood bank of San Bernardino, CA. Donors signed prior to the blood collection a consent form and agreed that their blood will be used in genetic studies with regard to human aging. All samples were anonymized. Tracking back of samples is not possible.

Isolation of DNA from blood samples of a healthy donor population

Blood is obtained from a donor by venous puncture and preserved with 1mM EDTA pH 8.0. Ten milliliters of whole blood from each donor was centrifuged at 2000x g. One milliliter of the buffy coat was added to 9 milliliters of 155mM NH_4Cl , 10mM KHCO_3 , and 0.1mM Na_2EDTA , incubated 10 minutes at room temperature and centrifuged for 10 minutes at 2000x g. The supernatant was removed, and the white cell pellet was washed in 155mM NH_4Cl , 10mM KHCO_3 , and 0.1mM Na_2EDTA and resuspended in 4.5 milliliters of 50mM Tris, 5mM EDTA, and 1% SDS. Proteins were precipitated from the cell lysate by 6M Ammonium Acetate, pH 7.3, and separated from the nucleic acid by centrifugation 3000x g. The nucleic acid was recovered from the supernatant by the addition of an equal volume of 100% isopropanol and centrifugation at 2000x g. The dried nucleic acid pellet was hydrated in 10mM Tris pH 7.6 and 1mM Na_2EDTA and stored at 4C.

-54-

In this study, samples were pooled as shown in Table 1. Both parents of the blood donors were of Caucasian origin.

Table 1

Pool ID	Sex	Age-range	# individuals
SP1	Female	18-39 years	276
SP2	Males	18-39 years	276
SP3	Females	60-69 years	184
SP4	Males	60-79 years	368

- 10 More than 400 SNPs were tested using all four pools. After one test run 34 assays were selected to be re-assayed at least once. Finally, 10 assays showed repeatedly differences in allele frequencies of several percent and, therefore, fulfilled the criteria to be tested using the individual samples. Average allele frequency and standard deviation is
- 15 tabulated in Table 2.

Table 2

Assay ID	SP1	SP1-STD	SP2	SP2-STD	SP3	SP3-STD	SP4	SP4-STD
47861	0.457	0.028	0.433	0.042	0.384	0.034	0.380	0.015
47751	0.276	0.007	0.403	0.006	0.428	0.052	0.400	0.097
48319	0.676	0.013	0.627	0.018	0.755	0.009	0.686	0.034
48070	0.581	0.034	0.617	0.045	0.561	n.a.	0.539	0.032
49807	0.504	0.034	0.422	0.020	0.477	0.030	0.556	0.005
49534	0.537	0.017	0.503	n.a.	0.623	0.023	0.535	0.009
49733	0.560	0.006	0.527	0.059	0.546	0.032	0.436	0.016
49947	0.754	0.008	0.763	0.047	0.736	0.052	0.689	0.025
50128	0.401	0.022	0.363	0.001	0.294	0.059	0.345	0.013

-55-

63306	0.697	0.012	0.674	0.013	0.712	0.017	0.719	0.005
-------	-------	-------	-------	-------	-------	-------	-------	-------

So far, 7 out of the 10 potential morbidity markers were fully analyzed. Additional information about genes in which these SNPs are located was gathered through publicly databases like Genbank.

AKAPS

Candidate morbidity and mortality markers include housekeeping genes, such as genes involved in signal transduction. Among such genes are the A-kinase anchoring proteins (AKAPs) genes, which participate in signal transduction pathways involving protein phosphorylation. Protein phosphorylation is an important mechanism for enzyme regulation and the transduction of extracellular signals across the cell membrane in eukaryotic cells. A wide variety of cellular substrates, including enzymes, membrane receptors, ion channels and transcription factors, can be phosphorylated in response to extracellular signals that interact with cells. A key enzyme in the phosphorylation of cellular proteins in response to hormones and neurotransmitters is cyclic AMP (cAMP)-dependent protein kinase (PKA). Upon activation by cAMP, PKA thus mediates a variety of cellular responses to such extracellular signals. An array of PKA isozymes are expressed in mammalian cells. The PKAs usually exist as inactive tetramers containing a regulatory (R) subunit dimer and two catalytic (C) subunits. Genes encoding three C subunits ($C\alpha$, $C\beta$ and $C\gamma$) and four R subunits ($R\text{I}\alpha$, $R\text{I}\beta$, $R\text{II}\alpha$ and $R\text{II}\beta$) have been identified [see Takio *et al.* (1982) *Proc. Natl. Acad. Sci. U.S. A.* 79:2544-2548; Lee *et al.* (1983) *Proc. Natl. Acad. Sci. U.S. A.* 80:3608-3612; Jahnsen *et al.* (1996) *J. Biol. Chem.* 261:12352-12361; Clegg *et al.* (1988) *Proc. Natl. Acad. Sci. U.S. A.* 85:3703-3707; and Scott (1991) *Pharmacol. Ther.* 50:123-145]. The type I (RI) α and type II (RII) α subunits are distributed ubiquitously, whereas $R\text{I}\beta$ and $R\text{II}\beta$ are present mainly in brain [see. *e.g.*, Miki and Eddy

-56-

(1999) *J. Biol. Chem.* 274:29057-29062]. The type I PKA holoenzyme (RI α and RI β) is predominantly cytoplasmic, whereas the majority of type II PKA (RII α and RII β) associates with cellular structures and organelles [Scott (1991) *Pharmacol. Ther.* 50:123-145]. Many hormones and other
5 signals act through receptors to generate cAMP which binds to the R subunits of PKA and releases and activates the C subunits to phosphorylate proteins. Because protein kinases and their substrates are widely distributed throughout cells, there are mechanisms in place in cells to localize protein kinase-mediated responses to different signals. One
10 such mechanism involves subcellular targeting of PKAs through association with anchoring proteins, referred to as A-kinase anchoring proteins (AKAPs), that place PKAs in close proximity to specific organelles or cytoskeletal components and particular substrates thereby providing for more specific PKA interactions and localized responses [see,
15 *e.g.*, Scott *et al.* (1990) *J. Biol. Chem.* 265:21561-21566; Bregman *et al.* (1991) *J. Biol. Chem.* 266:7207-7213; and Miki and Eddy (1999) *J. Biol. Chem.* 274:29057-29062]. Anchoring not only places the kinase close to preferred substrates, but also positions the PKA holoenzyme at sites where it can optimally respond to fluctuations in the second messenger
20 cAMP [Mochly-Rosen (1995) *Science* 268:247-251; Faux and Scott (1996) *Trends Biochem. Sci.* 21:312-315; Hubbard and Cohen (1993) *Trends Biochem. Sci.* 18:172-177].

Up to 75% of type II PKA is localized to various intracellular sites through association of the regulatory subunit (RII) with AKAPs [see, *e.g.*,
25 Hausken *et al.* (1996) *J. Biol. Chem.* 271:29016-29022]. RII subunits of PKA bind to AKAPs with nanomolar affinity [Carr *et al.* (1992) *J. Biol. Chem.* 267:13376-13382], and many AKAP-RII complexes have been isolated from cell extracts. RI subunits of PKA bind to AKAPs with only micromolar affinity [Burton *et al.* (1997) *Proc. Natl. Acad. Sci. U.S.A.*

-57-

94:11067-11072]. Evidence of binding of a PKA RI subunit to an AKAP has been reported [Miki and Eddy (1998) *J. Biol. Chem.* 273:34384-34390] in which RI α -specific and RI α /RII α dual specificity PKA anchoring domains were identified on FSC1/AKAP82. Additional dual specific

5 AKAPs, referred to as D-AKAP1 and D-AKAP2, which interact with the type I and type II regulatory subunits of PKA have also been reported [Huang *et al.* (1997) *J. Biol. Chem.* 272:8057-8064; Huang *et al.* (1997) *Proc. Natl. Acad. Sci. U.S.A.* 94:11184-11189].

More than 20 AKAPs have been reported in different tissues and

10 species. Complementary DNAs (cDNAs) encoding AKAPs have been isolated from diverse species, ranging from *Caenorhabditis elegans* and *Drosophila* to human [see, *e.g.*, Colledge and Scott (1999) *Trends Cell Biol.* 9:216-221]. Regions within AKAPs that mediate association with RII subunits of PKA have been identified. These regions of approximately

15 10-18 amino acid residues vary substantially in primary sequence, but secondary structure predictions indicate that they are likely to form an amphipathic helix with hydrophobic residues aligned along one face of the helix and charged residues along the other [Carr *et al.* (1991) *J. Biol. Chem.* 266:14188-14192; Carr *et al.* (1992) *J. Biol. Chem.* 267:13376-

20 13382]. Hydrophobic amino acids with a long aliphatic side chain, *e.g.*, valine, leucine or isoleucine, may participate in binding to RII subunits [Glantz *et al.* (1993) *J. Biol. Chem.* 268:12796-12804].

Many AKAPs also have the ability to bind to multiple proteins, including other signaling enzymes. For example, AKAP79 binds to PKA,

25 protein kinase C (PKC) and the protein phosphatase calcineurin (PP2B) [Coghlan *et al.* (1995) *Science* 267:108-112 and Klauck *et al.* (1996) *Science* 271:1589-1592]. Therefore, the targeting of AKAP79 to neuronal postsynaptic membranes brings together enzymes with opposite catalytic activities in a single complex.

-58-

AKAPs thus serve as potential regulatory mechanisms that increase the selectivity and intensity of a cAMP-mediated response. There is a need, therefore, to identify and elucidate the structural and functional properties of AKAPs in order to gain a complete understanding of the important role these proteins play in the basic functioning of cells.

AKAP10

The sequence of a human AKAP10 cDNA (also referred to as D-AKAP2) is available in the GenBank database, at accession numbers AF037439 (SEQ ID NO: 31) and NM 007202. The AKAP10 gene is located on chromosome 17.

The sequence of a mouse D-AKAP2 cDNA is also available in the GenBank database (see accession number AF021833). The mouse D-AKAP2 protein contains an RGS domain near the amino terminus that is characteristic of proteins that interact with $G\alpha$ subunits and possess GTPase activating protein-like activity [Huang *et al.* (1997) *Proc. Natl. Acad. Sci. U.S.A.* 94:11184-11189]. The human AKAP10 protein also has sequences homologous to RGS domains. The carboxy-terminal 40 residues of the mouse D-AKAP2 protein are responsible for the interaction with the regulatory subunits of PKA. This sequence is fairly well conserved between the mouse D-AKAP2 and human AKAP10 proteins.

Polymorphisms of the human AKAP10 gene and polymorphic AKAP10 proteins

Polymorphisms of AKAP genes that alter gene expression, regulation, protein structure and/or protein function are more likely to have a significant effect on the regulation of enzyme (particularly PKA) activity, cellular transduction of signals and responses thereto and on the basic functioning of cells than polymorphisms that do not alter gene and/or protein function. Included in the polymorphic AKAPs provided herein are human AKAP10 proteins containing differing amino acid residues at position number 646.

-59-

Amino acid 646 of the human AKAP10 protein is located in the carboxy-terminal region of the protein within a segment that participates in the binding of R-subunits of PKAs. This segment includes the carboxy-terminal 40 amino acids.

- 5 The amino acid residue reported for position 646 of the human AKAP10 protein is an isoleucine. Polymorphic human AKAP10 proteins provided herein have the amino acid sequence but contain residues other than isoleucine at amino acid position 646 of the protein. In particular embodiments of the polymorphic human AKAP10 proteins provided
10 herein, the amino acid at position 646 is a valine, leucine or phenylalanine residue.

An A to G transition at nucleotide 2073 of the human AKAP10 coding sequence

- As described herein, an allele of the human AKAP10 gene that
15 contains a specific polymorphism at position 2073 of the coding sequence and thereby encodes a valine at position 646 has been detected in varying frequencies in DNA samples from younger and older segments of the human population. In this allele, the A at position 2073 of the AKAP10 gene coding sequence is changed from an A to a G, giving rise
20 to an altered sequence in which the codon for amino acid 646 changes from ATT, coding for isoleucine, to GTT, coding for valine.

Morbidity marker 1: human protein kinase A anchoring protein (AKAP10-1)

- PCR Amplification and BiomassPROBE assay detection of AKAP10-1 in a
25 healthy donor population

PCR Amplification of donor population for AKAP 10

- PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10 target sequence was carried out in single 50 μ l PCR reaction with 100ng-1 μ g of pooled human genomic
30 DNAs in a 50 μ l PCR reaction. Individual DNA concentrations within the

-60-

- pooled samples were present in equal concentration with the final concentration ranging from 1-25ng. Each reaction containing IX PCR buffer (Qiagen, Valencia, CA), 200uM dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, CA), 4mM MgCl₂, and 25pmol of the
- 5 forward primer containing the universal primer sequence and the target specific sequence 5'-TCTCAATCATGTGCATTGAGG-3' (SEQ ID NO: 45), 2pmol of the reverse primer
- 5'-AGCGGATAACAATTTTCACACAGGGATCACACAGCCATCAGCAG-3' (SEQ ID NO: 46), and 10pmol of a biotinylated universal primer
- 10 complementary to the 5' end of the PCR amplicon 5'-AGCGGATAACAATTTTCACACAGG-3' (SEQ ID NO: 47). After an initial round of amplification with the target with the specific forward and reverse primer, the 5' biotinylated universal primer then hybridized and acted as a reverse primer thereby introducing a 3' biotin capture moiety
- 15 into the molecule. The amplification protocol results in a 5'-biotinylated double stranded DNA amplicon and dramatically reduces the cost of high throughput genotyping by eliminating the need to 5' biotin label each forward primer used in a genotyping. Thermal cycling was performed in 0.2mL tubes or 96 well plate using an MJ Research Thermal Cycler
- 20 (calculated temperature) with the following cycling parameters: 94° C for 5 min; 45 cycles: 94° C for 20 sec, 56° C for 30 sec, 72° C for 60 sec; 72° C 3min.

Immobilization of DNA

- The 50μl PCR reaction was added to 25ul of streptavidin coated magnetic
- 25 bead (Dynal) prewashed three times and resuspended in 1M NH₄Cl, 0.06M NH₄OH. The PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet and the supernatant containing unbound DNA was removed. The unbound strand was release from the double stranded amplicons by

-61-

incubation in 100mM NaOH and washing of the beads three times with 10mM Tris pH 8.0.

BiomassPROBE assay analysis of donor population for AKAP10-1 (clone 48319)

- 5 Genotyping using the BiomassPROBE assay methods was carried out by resuspending the DNA coated magnetic beads in 26mM Tris-HCl pH 9.5, 6.5 mM MgCl₂ and 50mM each of dTTP and 50mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Amersham) and 20pmol of a template specific oligonucleotide PROBE
- 10 primer 5'-CTGGCGCCCACGTGGTCAA-3' (SEQ ID NO: 48) (Operon). Primer extension occurs with three cycles of oligonucleotide primer hybridization and extension. The extension products were analyzed after denaturation from the template with 50mM NH₄Cl and transfer of 150nL each sample to a silicon chip preloaded with 150nL of H3PA matrix
- 15 material. The sample material was allowed to crystallize and was analyzed by MALDI-TOF (Bruker, PerSeptive). The SNP that is present in AKAP10-1 is a T to C transversion at nucleotide number 156277 of the sequence of a genomic clone of the AKAP10 gene (GenBank Accession No. AC005730) (SEQ ID NO: 36). SEQ ID NO: 35: represents the
- 20 nucleotide sequence of human chromosome 17, which contains the genomic nucleotide sequence of the human AKAP10 gene, and SEQ ID NO: represents the nucleotide sequence of human chromosome 17, which contains the genomic nucleotide sequence of the human AKAP10-1 allele. The mass of the primer used in the BioMass probe reaction was
- 25 5500.6 daltons. In the presence of the SNP, the primer is extended by the addition of ddC, which has a mass of 5773.8. The wildtype gene results in the addition of dT and ddG to the primer to produce an extension product having a mass of 6101 daltons.

-62-

The frequency of the SNP was measured in a population of age selected healthy individuals. Five hundred fifty-two (552) individuals between the ages of 18-39 years (276 females, 276 males) and 552 individuals between the ages of 60-79 (184 females between the ages of 60-69, 368 males between the age of 60-79) were tested for the presence of the polymorphism localized in the non-translated 3' region of AKAP 10. Differences in the frequency of this polymorphism with increasing age groups were observed among healthy individuals. Statistical analysis showed that the significance level for differences in the allelic frequency for alleles between the "younger" and the "older" populations was $p = 0.0009$ and for genotypes was $p = 0.003$. Differences between age groups are significant. For the total population allele significance is $p = 0.0009$, and genotype significance is $p = 0.003$.

This marker led to the best significant result with regard to allele and genotype frequencies in the age-stratified population. Figure 19 shows the allele and genotype frequency in both genders as well as in the entire population. For latter the significance for alleles was $p = 0.0009$ and for genotypes was $p = 0.003$. The young and old populations were in Hardy-Weinberg equilibrium. A preferential change of one particular genotype was not seen.

The polymorphism is localized in the non-translated 3'-region of the gene encoding the human protein kinase A anchoring protein (AKAP10). The gene is located on chromosome 17. Its structure includes 15 exons and 14 intervening sequences (introns). The encoded protein is responsible for the sub-cellular localization of the cAMP-dependent protein kinase and, therefore, plays a key role in the G-protein mediated receptor-signaling pathway (Huang et al. PNAS (1007) 94:11184-11189). Since its localization is outside the coding region, this polymorphism is most likely in linkage disequilibrium (LD) with other non-synonymous

-63-

- polymorphisms that could cause amino acid substitutions and subsequently alter the function of the protein. Sequence comparison of different Genbank database entries concerning this gene revealed further six potential polymorphisms of which two are supposed to change the
- 5 respective amino acid (see Table 3).

Table 3

10	Exon	Codon	Nucleotides	Amino acid
	3	100	GCT > GCC	Ala > Ala
	4	177	AGT > GTG	Met > Val
	8	424	GGG > GGC	Gly > Gly
	10	524	CCG > CTG	Pro > Leu
	12	591	GTG > GTC	Val > Val
	12	599	CGC > CGA	Arg > Arg

15 **Morbidity marker 2: human protein kinase A anchoring protein (AKAP10-5)**

Discovery of AKAP10-5 Allele (SEQ ID NO: 33)

- Genomic DNA was isolated from blood (as described above) of seventeen (17) individuals with a genotype CC at the AKAP10-1 gene
- 20 locus and a single heterozygous individual (CT) (as described). A target sequence in the AKAP10-1 gene which encodes the C-terminal PKA binding domain was amplified using the polymerase chain reaction. PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10-1 target sequence was carried out in
- 25 individual 50 μ l PCR reaction with 25ng of human genomic DNA templates. Each reaction containing 1 X PCR buffer (Qiagen, Valencia, CA), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, CA), 4mM MgCl₂, 25pmol of the forward primer (Ex13F) containing the universal primer sequence and the target specific sequence 5'-TCC CAA
- 30 AGT GCT GGA ATT AC-3' (SEQ ID NO: 53), and 2pmol of the reverse

-64-

primer (Ex14R) 5'-GTC CAA TAT ATG CAA ACA GTT G-3' (SEQ ID NO: 54). Thermal cycling was performed in 0.2mL tubes or 96 well plate using an MJ Research Thermal Cycler (MJ Research, Waltham, MA) (calculated temperature) with the following cycling parameters: 94° C for 5 min; 45 cycles; 94° C for 20 sec, 56° C for 30 sec, 72° C for 60 sec; 72° C 3min. After amplification the amplicons were purified using a chromatography (Mo Bio Laboratories (Solana Beach, CA)).

The sequence of the 18 amplicons, representing the target region, was determined using a standard Sanger cycle sequencing method with 25nmol of the PCR amplicon, 3.2uM DNA sequencing primer 5'-CCC ACA GCA GTT AAT CCT TC-3'(SEQ ID NO: 55), and chain terminating dRhodamine labeled 2', 3' dideoxynucleotides (PE Biosystems, Foster City, CA) using the following cycling parameters: 96° C for 15 seconds; 25 cycles: 55° C for 15 seconds, 60° C for 4 minutes. The sequencing products precipitated by 0.3M NaOAc and ethanol. The precipitate was centrifuged and dried. The pellets were resuspended in deionized formamide and separated on a 5% polyacrylimide gel. The sequence was determined using the "Sequencher" software (Gene Codes, Ann Arbor, MI).

The sequence of all 17 of the amplicons, which are homozygous for the AKAP10-1 SNP of the amplicons, revealed a polymorphism at nucleotide position 152171 (numbering for GenBank Accession No. AC005730 for AKAP10 genomic clone (SEQ ID NO: 35)) with A replaced by G. This SNP can also be designated as located at nucleotide 2073 of a cDNA clone of the wildtype AKAP10 (GenBank Accession No. AF037439) (SEQ ID NO: 31). The amino acid sequence of the human AKAP10 protein is provided as SEQ ID NO: 32. This single nucleotide polymorphism was designated as AKAP10-5 (SEQ ID NO: 33) and resulted in a substitution of a valine for an isoleucine residue at amino

-65-

acid position 646 of the amino acid sequence of human AKAP10 (SEQ ID NO: 32).

PCR Amplification and BiomassPROBE assay detection of AKAP10-5 in a healthy donor population

- 5 The healthy population stratified by age is a very efficient and a universal screening tool for morbidity associated genes by allowing for the detection of changes of allelic frequencies in the young compared to the old population. Individual samples of this healthy population base can be pooled to further increase the throughput.
- 10 Healthy samples were obtained through the blood bank of San Bernardino, CA. Both parents of the blood donors were of Caucasian origin. Practically a healthy subject, when human, is defined as human donor who passes blood bank criteria to donate blood for eventual use in the general population. These criteria are as follows: free of detectable
- 15 viral, bacterial, mycoplasma, and parasitic infections; not anemic; and then further selected based upon a questionnaire regarding history (see Figure 3). Thus, a healthy population represents an unbiased population of sufficient health to donate blood according to blood bank criteria, and not further selected for any disease state. Typically such individuals are
- 20 not taking any medications.
- PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10 target sequence was carried out in a single 50 μ l PCR reaction with 100ng- 1 μ g of pooled human genomic DNAs in a 50 μ l PCR reaction. Individual DNA concentrations within the
- 25 pooled samples were present in equal concentration with the final concentration ranging from 1-25ng. Each reaction contained 1X PCR buffer (Qiagen, Valencia, CA), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, CA), 4mM MgCl₂, and 25pmol of the forward primer containing the universal primer sequence and the target specific
- 30 sequence 5'-AGCGGATAACAATTTACACAGGGAGCTAGCTTGGAAGAT

-66-

TGC-3' (SEQ ID NO: 41), 2pmol of the reverse primer 5'-GTCCAATATATGCAAACAGTTG-3' (SEQ ID NO: 54), and 10pmol of a biotinylated universal primer complementary to the 5' end of the PCR amplicon BIO:5'-AGCGGATAACAATTTACACAGG-3' (SEQ ID NO: 43).

- 5 After an initial round of amplification with the target with the specific forward and reverse primer, the 5' biotinylated universal primer can then be hybridized and acted as a forward primer thereby introducing a 5' biotin capture moiety into the molecule. The amplification protocol resulted in a 5'-biotinylated double stranded DNA amplicon and
- 10 dramatically reduced the cost of high throughput genotyping by eliminating the need to 5' biotin label every forward primer used in a genotyping.

- Thermal cycling was performed in 0.2mL tubes or 96 well plate using an MJ Research Thermal Cycler (calculated temperature) with the
- 15 following cycling parameters: 94° C for 5 min; 45 cycles: 94° C for 20 sec, 56° C for 30 sec; 72° C for 60 sec; 72° C 3min.

Immobilization of DNA

- The 50 μ L PCR reaction was added to 25 μ L of streptavidin coated magnetic beads (Dynal, Oslo, Norway), which were prewashed three
- 20 times and resuspended in 1M NH₄Cl, 0.06M NH₄OH. The 5' end of one strand of the double stranded PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet and the supernatant containing unbound DNA was removed. The hybridized but unbound strand was released from the
- 25 double stranded amplicons by incubation in 100mM NaOH and washing of the beads three times with 10mM Tris pH 8.0.

Detection of AKAP10-5 using BiomassPROBE™ Assay

BiomassPROBE™ assay of primer extension analysis (see, U.S. Patent No. 6,043,031) of donor population for AKAP 10-5 (SEQ ID NO:

-67-

33) was performed. Genotyping using these methods was carried out by resuspending the DNA coated magnetic beads in 26mM Tris-HCL pH 9.5, 6.5 mM MgCl₂, 50mM dTTP, 50mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Ambersham), and 20pmol of a

5 template specific oligonucleotide PROBE primer
 5'-ACTGAGCCTGCTGCATAA-3' (SEQ ID NO: 44) (Operon). Primer extension occurs with three cycles of oligonucleotide primer with hybridization and extension. The extension products were analyzed after denaturation from the template with 50 mM NH₄Cl and transfer of 150 nL

10 of each sample to a silicon chip preloaded with 150 nl of H3PA matrix material. The sample material was allowed to crystallize and analyzed by MALDI-TOF (Bruker, PerSeptive). The primer has a mass of 5483.6 daltons. The SNP results in the additional of a ddC to the primer, giving a mass of 5756.8 daltons for the extended product. The wild type results in

15 the addition a T and ddG to the primer giving a mass of 6101 daltons.

The frequency of the SNP was measured in a population of age selected healthy individuals. Seven hundred thirteen (713) individuals under 40 years of age (360 females, 353 males) and 703 individuals over 60 years of age (322 females, 381 males) were tested for the presence of

20 the SNP, AKAP10-5 (SEQ ID NO: 33). Results are presented below in Table 1.

TABLE 1					
AKAP10-5 (2073V) frequency comparison in 2 age groups					
			<40	>60	delta G allele
25	Female	Alleles	*G	38.6	34.6
			*A	61.4	65.4
	Genotypes	G	13.9	11.8	2.1
		GA	49.4	45.7	
		A	36.7	42.5	

-68-

5	Male	Alleles	*G	41.4	37.0	4.4
			*A	58.6	63.0	
		Genotypes	G	18.4	10.8	7.7
			GA	45.9	52.5	
			A	35.7	36.7	
10	Total	Alleles	*G	40.0	35.9	4.1
			*A	60.0	64.1	
		Genotypes	G	16.1	11.2	4.9
			GA	47.7	49.4	
			A	36.2	39.4	

Figure 20 graphically shows these results of allele and genotype distribution in the age and sex stratified Caucasian population.

Morbidity marker 3: human methionine sulfoxide reductase A (msrA)

The age-related allele and genotype frequency of this marker in both genders and the entire population is shown in Figure 21. The decrease of the homozygous CC genotype in the older male population is highly significant.

Methionine sulfoxide reductase A (#63306)

PCR Amplification and BiomassPROBE assay detection of the human methioine sulfoxid reductase A (h-msr-A) in a healthy donor population
PCR Amplification of donor population for h-msr-A

PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10 target sequence was carried out in single 50 μ l PCR reaction with 100ng-1ug of pooled human genomic DNA templates in a 50 μ l PCR reaction. Individual DNA concentrations within the pooled samples were present in an equal concentration with

-69-

- the final concentration ranging from 1-25ng. Each reaction containing 1 X PCR buffer (Qiagen, Valencia, CA), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, CA), 4mM MgCl₂, 25pmol of the forward primer containing the universal primer sequence and the target specific
- 5 sequence 5'-TTTCTCTGCACAGAGAGGC-3' (SEQ ID NO: 49), 2pmol of the reverse primer
- 5'-AGCGGATAACAATTTACACAGGGCTGAAATCCTTCGCTTTACC-3' (SEQ ID NO: 50), and 10pmol of a biotinylated universal primer complementary to the 5' end of the PCR amplicon
- 10 5'-AGCGGATAACAATTTACACAGG-3' (SEQ ID NO: 51). After an initial round of amplification of the target with the specific forward and reverse primers, the 5' biotinylated universal primer was then hybridized and acted as a reverse primer thereby introducing a 3' biotin capture moiety into the molecule. The amplification protocol results in a 5'-biotinylated
- 15 double stranded DNA amplicon and dramatically reduces the cost of high throughput genotyping by eliminating the need to 5' biotin label each forward primer used in a genotyping. Thermal cycling was performed in 0.2mL tubes or 96 well plate using an MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94° C for
- 20 5 min; 45 cycles: 94° C for 20 sec, 56° C for 30 sec, 72° C for 60 sec; 72° C 3min.

Immobilization of DNA

- The 50 μ l PCR reaction was added to 25ul of streptavidin coated magnetic bead (Dyna) prewashed three times and resuspended in 1M
- 25 NH₄Cl, 0.06M NH₄OH. The PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet and the supernatant containing unbound DNA was removed. The unbound strand was release from the double stranded

-70-

amplicons by incubation in 100mM NaOH and washing of the beads three times with 10mM Tris pH 8.0.

BiomassPROBE assay analysis of donor population for h-msr A

- Genotyping using the BiomassPROBE assay methods was carried
- 5 out by resuspending the he DNA coated magnetic beads in 26mM Tris-HCl pH 9.5, 6.5 mM MgCl₂, 50mM of dTTPs and 50mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Amersham), and 20pmol of a template specific oligonucleotide PROBE primer 5'-CTGAAAAGGGAGAGAAAG-3' (Operon) (SEQ ID NO: 52).
- 10 Primer extension occurs with three cycles of oligonucleotide primer with hybridization and extension. The extension products were analyzed after denaturation from the template with 50mM NH₄Cl and transfer of 150nl each sample to a silicon chip preloaded with 150nl of H3PA matrix material. The sample material was allowed to crystallize and analyzed by
- 15 MALDI-TOF (Bruker, PerSeptive). The SNP is represented as a T to C transversion in the sequence of two ESTs. The wild type is represented by having a T at position 128 of GenBank Accession No. AW 195104, which represents the nucleotide sequence of an EST which is a portion of the wild type human msrA gene (SEQ ID NO: 39). The SNP is presented
- 20 as a C at position 129 of GenBank Accession No. AW 874187, which represents the nucleotide sequence of an EST which is a portion of an allele of the human msrA gene (SEQ ID NO: 40).

- In a genomic sequence the SNP is represented as an A to G transversion. The primer utilized in the BioMass probe reaction had a
- 25 mass of 5654.8 daltons. In the presence of the SNP the primer is extended by the incorporation of a ddC and has a mass of 5928. In the presence of the wildtype the primer is extended by adding a dT and a DDC to produce a mass of 6232.1 daltons.

-71-

The frequency of the SNP was measured in a population of age selected healthy individuals. Five hundred fifty-two (552) individuals between the ages of 18-39 years (276 females, 276 males and 552 individuals between the age of 60-79 (184 females between the ages of
5 60-69, 368 males between the age of 60-79) were tested for the presence of the polymorphism localized in the nontranslated 3' region of h-msr-A.

Genotype difference between male age group among healthy individuals is significant. For the male population allele significance is
10 $p=0.0009$ and genotype significance is $p=0.003$. The age-related allele and genotype frequency of this marker in both genders and the entire population is shown in Figure 21. The decrease of the homozygous CC genotype in the older male population is highly significant.

The polymorphism is localized in the non-translated 3'-region of the
15 gene encoding the human methionine sulfoxide reductase (h-msrA). The exact localization is 451 base pairs downstream the stop codon (TAA). It is very likely that this SNP is in linkage disequilibrium (LD) with another polymorphism more upstream in the coding or promoter region; thus, it is not directly cause morbidity. The enzyme methionine sulfoxide reductase
20 has been proposed to exhibit multiple biological functions. It may serve to repair oxidative protein damage but also play an important role in the regulation of proteins by activation or inactivation of their biological functions (Moskovitz et al. (1990) PNAS 95:14071-14075). It has also been shown that its activity is significantly reduced in brain tissues of
25 Alzheimer patients (Gabbita et al., (1999) J. Neurochem 73:1660-1666). It is scientifically conceivable that proteins involved in the metabolism of reactive oxygen species are associated to disease.

-72-

CONCLUSION

The use of the healthy population provides for the identification of morbidity markers. The identification of proteins involved in the G-protein coupled signaling transduction pathway or in the detoxification of oxidative stress can be considered as convincing results. Further confirmation and validation of other potential polymorphisms already identified *in silico* in the gene encoding the human protein kinase A anchoring protein could even provide stronger association to morbidity and demonstrate that this gene product is a suitable pharmaceutical or diagnostic target.

EXAMPLE 4**MALDI-TOF Mass Spectrometry Analysis**

All of the products of the enzyme assays listed below were analyzed by MALDI-TOF mass spectrometry. A diluted matrix solution (0.15 μ L) containing of 10:1 3-hydroxypicolinic acid:ammonium citrate in 1:1 water:acetonitrile diluted 2.5-fold with water was pipetted onto a SpectroChip (Sequenom, Inc.) and was allowed to crystallize. Then, 0.15 μ L of sample was added. A linear PerSeptive Voyager DE mass spectrometer or Bruker Biflex MALDI-TOF mass spectrometer, operating in positive ion mode, was used for the measurements. The sample plates were kept at 18.2 kV for 400 nm after each UV laser shot (approximate 250 laser shots total), and then the target voltage was raised to 20 kV. The original spectra were digitized at 500 MHz.

EXAMPLE 5**Sample Conditioning**

Where indicated in the examples below, the products of the enzymatic digestions were purified with ZipTips (Millipore, Bedford, MA). The ZipTips were pre-wetted with 10 μ L 50% acetonitrile and equilibrated 4 times with 10 μ L 0.1 M TEAAc. The oligonucleotide fragments were

-73-

bound to the C18 in the ZipTip material by continuous aspiration and dispensation of each sample into the ZipTip. Each digested oligonucleotide was conditioned by washing with 10 μ L 0.1 M TEAAc, followed by 4 washing steps with 10 μ L H₂O. DNA fragments were eluted from the

5 Ziptip with 7 μ L 50% acetonitrile.

Any method for condition the samples may be employed. Methods for conditioning, which generally is used to increase peak resolution, are well known (see, *e.g.*, International PCT application No. WO 98/20019).

EXAMPLE 6

10 DNA Glycosylase-Mediated Sequence Analysis

DNA Glycosylases modifies DNA at each position that a specific nucleobase resides in the DNA, thereby producing abasic sites. In a subsequent reaction with another enzyme, a chemical, or heat, the phosphate backbone at each abasic site can be cleaved.

15 The glycosylase utilized in the following procedures was uracil-DNA glycosylase (UDG). Uracil bases were incorporated into DNA fragments in each position that a thymine base would normally occupy by amplifying a DNA target sequence in the presence of uracil. Each uracil substituted DNA amplicon was incubated with UDG, which cleaved each uracil base

20 in the amplicon, and was then subjected to conditions that effected backbone cleavage at each abasic site, which produced DNA fragments. DNA fragments were subjected to MALDI-TOF mass spectrometry analysis. Genetic variability in the target DNA was then assessed by analyzing mass spectra.

25 Glycosylases specific for nucleotide analogs or modified nucleotides, as described herein, can be substituted for UDG in the following procedures. The glycosylase methods described hereafter, in conjunction with phosphate backbone cleavage and MALDI, can be used to analyze DNA fragments for the purposes of SNP scanning, bacteria

-74-

typing, methylation analysis, microsatellite analysis, genotyping, and nucleotide sequencing and re-sequencing.

A. Genotyping

A glycosylase procedure was used to genotype the DNA sequence encoding UCP-2 (Uncoupling Protein 2). The sequence for UCP-2 is deposited in GenBank under accession number AF096289. The sequence variation genotyped in the following procedure was a cytosine (C-allele) to thymine (T-allele) variation at nucleotide position 4790, which results in a alanine to valine mutation at position 55 in the UCP-2 polypeptide.

DNA was amplified using a PCR procedure with a 50 μ L reaction volume containing of 5 pmol biotinylated primer having the sequence 5'-TGCTTATCCCTGTAGCTACCCTGTCTTGGCCTTGCAGATCCAA-3' (SEQ ID NO: 91), 15 pmol non-biotinylated primer having the sequence 5'-AGCGGATAACAATTTACACAGGCCATCACACCGCGGTACTG-3' (SEQ ID NO: 92), 200 μ M dATP, 200 μ M dCTP, 200 μ M dGTP, 600 μ M dUTP (to fully replace dTTP), 1.5 mM to 3 mM $MgCl_2$, 1 U of HotStarTaq polymerase, and 25 ng of CEPH DNA. Amplification was effected with 45 cycles at an annealing temperature of 56°C.

The amplification product was then immobilized onto a solid support by incubating 50 μ L of the amplification reaction with 5 μ L of prewashed Dynabeads for 20 minutes at room temperature. The supernatant was removed, and the beads were incubated with 50 μ L of 0.1 M NaOH for 5 minutes at room temperature to denature the double-stranded PCR product in such a fashion that single-stranded DNA was linked to the beads. The beads were then neutralized by three washes with 50 μ L 10 mM TrisHCl (pH 8). The beads were resuspended in 10 μ L of a 60mM TrisHCl/1mM EDTA (pH 7.9) solution, and 1 U uracil DNA glycosylase was added to the solution for 45 minutes at 37°C to remove uracil nucleotides present in the single-stranded DNA linked to the beads.

-75-

The beads were then washed two times with 25 μ L of 10 mM TrisHCl (pH 8) and once with 10 μ L of water. The biotinylated strands were then eluted from the beads with 12 μ L of 2 M NH_4OH at 60°C for 10 minutes. The backbone of the DNA was cleaved by incubating the samples for 10
5 min at 95°C (with a closed lid), and ammonia was evaporated from the samples by incubating the samples for 11 min at 80°C.

The cleavage fragments were then analyzed by MALDI-TOF mass spectrometry as described in Example 4. The T-allele generated a unique fragment of 3254 Daltons. The C-allele generated a unique fragment of
10 4788 Daltons. These fragments were distinguishable in mass spectra. Thus, the above-identified procedure was successfully utilized to genotype individuals heterozygous for the C-allele and T-allele in UCP-2.

B. Glycosylase Analysis Utilizing Pooled DNA Samples

The glycosylase assay was conducted using pooled samples to
15 detect genetic variability at the UCP-2 locus. DNA of known genotype was pooled from eleven individuals and was diluted to a fixed concentration of 5 ng/ μ L. The procedure provided in Example 3A was followed using 2 pmol of forward primer having a sequence of 5'-
CCCAGTCACGACGTTGTAAACGTCTTGGCCTTGCAGATCCAAG-3'
20 (SEQ ID NO: 93) and 15 pmol of reverse primer having the sequence 5'-
AGCGGATAACAATTTACACAGGCCATCACACCGCGGTACTG-3' (SEQ ID NO: 94). In addition, 5 pmol of biotinylated primer having the sequence 5'-bioCCCAGTCACGACGTTGTAAACG 3' (SEQ ID NO: 97) may be introduced to the PCR reaction after about two cycles. The
25 fragments were analyzed via MALDI-TOF mass spectroscopy (Example 4). As determined in Example 3A, the T-allele, which generated a unique fragment of 3254 Daltons, could be distinguished in mass spectra from the C-allele, which generated a unique fragment of 4788 Daltons. Allelic frequency in the pooled samples was quantified by integrating the area

-76-

under each signal corresponding to an allelic fragment. Integration was accomplished by hand calculations using equations well known to those skilled in the art. In the pool of eleven samples, this procedure suggested that 40.9% of the individuals harbored the T allele and 59.09% of the
5 individuals harbored the C allele.

C. Glycosylase-Mediated Microsatellite Analysis

A glycosylase procedure was utilized to identify microsatellites of the Bradykinin Receptor 2 (BKR-2) sequence. The sequence for BKR-2 is deposited in GenBank under accession number X86173. BKR-2 includes
10 a SNP in the promoter region, which is a C to T variation, as well as a SNP in a repeated unit, which is a G to T variation. The procedure provided in Example 3A was utilized to identify the SNP in the promotor region, the SNP in the microsatellite repeat region, and the number of repeated units in the microsatellite region of BKR-2. Specifically, a
15 forward PCR primer having the sequence 5'-CTCCAGCTGGGCAGGAGTGC-3' (SEQ ID NO: 95) and a reverse primer having the sequence 5'-CACTTCAGTCGCTCCCT-3' (SEQ ID NO: 96) were utilized to amplify BKR-2 DNA in the presence of uracil. The amplicon was fragmented by UDG followed by backbone cleavage. The
20 cleavage fragments were analyzed by MALDI-TOF mass spectrometry as described in Example 4.

With regard to the SNP in the BKR-2 promotor region having a C to T variation, the C-allele generated a unique fragment having a mass of 7342.4 Daltons and the T-allele generated a unique fragment having a
25 mass of 7053.2 Daltons. These fragments were distinguishable in mass spectra. Thus, the above-identified procedure was successfully utilized to genotype individuals heterozygous for the C-allele and T-allele in the promotor region of BKR-2.

-77-

With regard to the SNP in the BKR-2 repeat region having a G to T variation, the T-allele generated a unique fragment having a mass of 1784 Daltons, which was readily detected in a mass spectrum. Hence, the presence of the T-allele was indicative of the G to T sequence variation in the repeat region of BKR-2.

In addition, the number of repeat regions was distinguished between individuals having two repeat sequences and individuals having three repeat sequences in BKR-2. The DNA of these individuals did not harbor the G to T sequence variation in the repeat sequence as each repeat sequence contained a G at the SNP locus. The number of repeat regions was determined in individual samples by calculating the area under a signal corresponding to a unique DNA fragment having a mass of 2771.6 Daltons. This signal in spectra generated from individuals having two repeat regions had an area that was thirty-three percent less than the area under the same signal in spectra generated from individuals having three repeat regions. Thus, the procedures discussed above can be utilized to genotype individuals for the number of repeat sequences present in BKR-2.

D. Bisulfite Treatment Coupled with Glycosylase Digestion

Bisulfite treatment of genomic DNA can be utilized to analyze positions of methylated cytosine residues within the DNA. Treating nucleic acids with bisulfite deaminates cytosine residues to uracil residues, while methylated cytosine remains unmodified. Thus, by comparing the sequence of a PCR product generated from genomic DNA that is not treated with bisulfite with the sequence of a PCR product generated from genomic DNA that is treated with bisulfite, the degree of methylation in a nucleic acid as well as the positions where cytosine is methylated can be deduced.

-78-

Genomic DNA (2 μ g) was digested by incubation with 1 μ L of a restriction enzyme at 37°C for 2 hours. An aliquot of 3 M NaOH was added to yield a final concentration of 0.3M NaOH in the digestion solution. The reaction was incubated at 37°C for 15 minutes followed by
5 treatment with 5.35M urea, 4.44M bisulfite, and 10mM hydroquinone, where the final concentration of hydroquinone is 0.5 mM.

The sample that was treated with bisulfite (sample A) was compared to the same digestion sample that had not undergone bisulfite treatment (sample B). After sample A was treated with bisulfite as
10 described above, sample A and sample B were amplified by a standard PCR procedure. The PCR procedure included the step of overlaying each sample with mineral oil and then subjecting the sample to thermocycling (20 cycles of 15 minutes at 55°C followed by 30 seconds at 95°C). The PCR reaction contained four nucleotide bases, C, A, G, and U. The
15 mineral oil was removed from each sample, and the PCR products were purified with glassmilk. Sodium iodide (3 volumes) and glassmilk (5 μ L) were added to samples A and B. The samples were then placed on ice for 8 minutes, washed with 420 μ L cold buffer, centrifuged for 10 seconds, and the supernatant fractions were removed. This process was
20 repeated twice and then 25 μ L of water was added. Samples were incubated for 5 minutes at 37 °C, were centrifuged for 20 seconds, and the supernatant fraction was collected, and then this incubation/centrifugation/supernatant fraction collection procedure was repeated. 50 μ L 0.1 M NaOH was then added to the samples to denature
25 the DNA. The samples were incubated at room temperature for 5 minutes, washed three times with 50 μ L of 10 mM TrisHCl (pH 8), and resuspended in 10 μ L 60mM TrisHCl/1mM EDTA, pH 7.9.

The sequence of PCR products from sample A and sample B were then treated with 2U of UDG (MBI Fermentas) and then subjected to

-79-

backbone cleavage, as described herein. The resulting fragments from each of sample A and sample B were analyzed by MALDI-TOF mass spectroscopy as described in Example 4. Sample A gave rise to a greater number of fragments than the number of fragments arising from sample
5 B, indicative that the nucleic acid harbored at least one methylated cytosine moiety.

EXAMPLE 7

Fen-Ligase-Mediated Haplotyping

Haplotyping procedures permit the selection of a fragment from one of an
10 individual's two homologous chromosomes and to genotype linked SNPs on that fragment. The direct resolution of haplotypes can yield increased information content, improving the diagnosis of any linked disease genes or identifying linkages associated with those diseases. In previous studies, haplotypes were typically reconstructed indirectly through
15 pedigree analysis (in cases where pedigrees were available) through laborious and unreliable allele-specific PCR or through single-molecule dilution methods well known in the art.

A haplotyping procedure was used to determine the presence of two SNPs, referred to as SNP1 and SNP2, located on one strand in a DNA
20 sample. The haplotyping procedure used in this assay utilized Fen-1, a site-specific "flap" endonuclease that cleaves DNA "flaps" created by the overlap of two oligonucleotides hybridized to a target DNA strand. The two overlapping oligonucleotides in this example were short arm and long arm allele-specific adaptors. The target DNA was an amplified nucleic
25 acid that had been denatured and contained SNP1 and SNP2.

The short arm adaptor included a unique sequence not found in the target DNA. The 3' distal nucleotide of the short arm adaptor was identical to one of the SNP1 alleles. Moreover, the long arm adaptor included two regions: a 3' region complementary to the short arm and a

-80-

5'gene-specific region complementary to the fragment of interest adjacent to the SNP. If there was a match between the adaptor and one of the homologues, the Fen enzyme recognized and cleaved the overlapping flap. The short arm of the adaptor was then ligated to the remainder of
5 the target fragment (minus the SNP site). This ligated fragment was used as the forward primer for a second PCR reaction in which only the ligated homologue was amplified. The second PCR product (PCR2) was then analyzed by mass spectrometry. If there was no match between the adaptors and the target DNA, there was no overlap, no cleavage by Fen-
10 1, and thus no PCR2 product of interest.

If there was more than one SNP in the sequence of interest, the second SNP (SNP2) was found by using an adaptor that was specific for SNP2 and hybridizing the adaptor to the PCR2 product containing the first SNP. The Fen-ligase and amplification procedures were repeated for the
15 PCR2 product containing the first SNP. If the amplified product yielded a second SNP, then SNP1 and SNP2 were on the same fragment.

If the SNP is unknown, then four allele-specific adaptors (e.g. C, G, A, and T) can be used to hybridize with the target DNA. The substrates are then treated with the Fen-ligase protocol, including amplification. The
20 PCR2 products may be analyzed by PROBE, as described herein, to determine which adaptors were hybridized to the DNA target and thus identify the SNPs in the sequence.

A Fen-ligase assay was used to detect two SNPs present in Factor VII. These SNPs are located 814 base pairs apart from each other. SNP1
25 was located at position 8401 (C to T), and SNP2 was located at 9215 (G to A) (SEQ ID #).

A. First Amplification Step

A PCR product (PCR1) was generated for a known heterozygous individual at SNP1, a short distance from the 5' end of the SNP.

-81-

Specifically, a 10 μ L PCR reaction was performed by mixing 1.5 mM $MgCl_2$, 200 μ M of each dNTP, 0.5 U HotStar polymerase, 0.1 μ M of a forward primer having the sequence 5'-GCG CTC CTG TCG GTG CCA (SEQ ID NO: 56), 0.1 μ M of a reverse primer having the sequence 5'-GCC
5 TGA CTG GTG GGG CCC (SEQ ID NO: 57), and 1 ng of genomic DNA. The annealing temperature was 58°C, and the amplification process yielded fragments that were 861 bp in length.

The PCR1 reaction mixture was divided in half and was treated with an exonuclease 1/SAP mixture (0.22 μ L mixture/5 μ L PCR1 reaction)
10 which contained 1.0 μ L SAP and 0.1 μ L exon1. The exonuclease treatment was done for 30 minutes at 37°C and then 20 minutes at 85°C to denature the DNA.

B. Adaptor Oligonucleotides

A solution of allele-specific adaptors (C and T), containing of one
15 long and one short oligonucleotide per adaptor, was prepared. The long arm and short arm oligonucleotides of each adaptor (10 μ M) were mixed in a 1:1 ratio and heated for 30 seconds at 95°C. The temperature was reduced in 2°C increments to 37°C for annealing. The C-adaptor had a short arm sequence of 5'-CAT GCA TGC ACG GTC (SEQ ID NO: 58) and
20 a long arm sequence of 5'-CAG AGA GTA CCC CTC GAC CGT GCA TGC ATG (SEQ ID NO: 59). Hence, the long arm of the adaptor was 30 bp (15 bp gene-specific), and the short arm was 15bp. The T-adaptor had a short arm sequence of 5'-CAT GCA TGC ACG GTT (SEQ ID NO: 60) and a long arm sequence of 5'-GTA CGT ACG TGC CAA CTC CCC ATG AGA
25 GAC (SEQ ID NO: 61). The adaptor could also have a hairpin structure in which the short and long arm are separated by a loop containing of 3 to 10 nucleotides (SEQ ID NO: 118).

C. FEN-ligase reaction

-82-

In two tubes (one tube for each allele-specific adaptor per sample) was placed a solution (Solution A) containing of 3.5 μ l 10 mM 16%PEG/50 mM MOPS, 1.2 μ l 25 mM $MgCl_2$, 1.5 μ l 10X Ampligase Buffer, and 2.5 μ l PCR1. Each tube containing Solution A was incubated
5 at 95°C for 5 minutes to denature the PCR1 product. A second solution (Solution B) containing of 1.65 μ l Ampligase (Thermostable ligase, Epicentre Technologies), 1.65 μ l 200ng/ μ l MFEN (from *Methanococcus jannaschii*), and 3.0 μ l of an allele specific adaptor (C or T) was prepared. Thus, different variations of Solution B, each variation containing of
10 different allele-specific adaptors, were made. Solution B was added to Solution A at 95°C and incubated at 55°C for 3 hours. The total reaction volume was 15.0 μ l per adaptor-specific reaction. For a bi-allelic system, 2 x 15.0 μ l reactions were required.

The Fen-ligase reaction in each tube was then deactivated by
15 adding 8.0 μ l 10 mM EDTA. Then, 1.0 μ l exoIII/Buffer (70%/30%) solution was added to each sample and incubated 30 minutes at 37°C, 20 minutes at 70°C (to deactivate exoIII), and 5 minutes at 95°C (to denature the sample and dissociate unused adaptor from template). The samples were cooled in an ice slurry and purified on UltraClean PCR
20 Clean-up (MoBio) spin columns which removed all fragments less than 100 base pairs in length. The fragments were eluted with 50 μ l H_2O .

D. Second Amplification Step

A second amplification reaction (PCR2) was conducted in each sample tube using the short arm adaptor (C or T) sequence as the forward
25 primer (minus the SNP1 site). Only the ligated homologue was amplified. A standard PCR reaction was conducted with a total volume of 10.0 μ l containing of 1X Buffer (final concentration), 1.5 mM final concentration $MgCl_2$, 200 μ M final concentration dNTPs, 0.5 U HotStar polymerase, 0.1 μ M final concentration forward primer 5'-CAT GCA TGC ACG GT (SEQ ID

-83-

NO: 62), 0.1 μ M final concentration reverse primer 5'-GCC TGA CTG GTG GGG CCC (SEQ ID NO: 63), and 1.0 μ l of the purified FEN-ligase reaction solution. The annealing temperature was 58°C. The PCR2 product was analyzed by MALDI TOF mass spectroscopy as described in Example 4.

- 5 The mass spectrum of Fen SNP1 showed a mass of 6084.08 Daltons, representing the C allele.

E. Genotyping Additional SNPs

- The second SNP (SNP2) can be found by using an adaptor that is specific for SNP2 and hybridizing that adaptor to the PCR2 product
- 10 containing the first SNP. The Fen-ligase and amplification procedures are repeated for the PCR2 product containing the first SNP. If the amplified product yields a second SNP, then SN1 and SN2 are on the same fragment. The mass spectrum of SNP2, representing the T allele, showed a mass of 6359.88 Daltons.
- 15 This assay can also be performed upon pooled DNA to yield haplotype frequencies as described herein. The Fen-ligase assay can be used to analyze multiplexes as described herein.

EXAMPLE 8

Nickase-Mediated Sequence Analysis

- 20 A DNA nickase, or DNase, was used to recognize and cleave one strand of a DNA duplex. Two nickases used were NY2A nickase and NYS1 nickase (Megabase) which cleave DNA at the following sites:

NY2A: 5'...R AG...3'

3'...Y↓TC...5' where R = A or G and Y = C or T

- 25 NYS1: 5'...↓CC[A/G/T]...3'

3'... GG[T/C/A]...5'.

-84-

A. Nickase Digestion

Tris-HCl (10 mM), KCl (10 mM, pH 8.3), magnesium acetate (25 mM), BSA (1 mg/mL), and 6 U of Cvi NY2A or Cvi NYS1 Nickase (Megabase Research) were added to 25 pmol of double-stranded
5 oligonucleotide template having a sequence of 5'-CGC AGG GTT TCC
TCG TCG CAC TGG GCA TGT G-3' (SEQ ID NO: 90, Operon, Alameda, CA) synthesized using standard phosphoramidite chemistry. With a total
volume of 20 μ L, the reaction mixture was incubated at 37°C for 5 hours, and the digestion products were purified using ZipTips (Millipore, Bedford,
10 MA) as described in Example 5. The samples were analyzed by MALTY-TOM mass spectroscopy as described in Example 1. The nickase Cvi
NY2A yielded three fragments with masses 4049.76 Daltons, 5473.14 Daltons, and 9540.71 Daltons. The Cvi NYS1 nickase yielded fragments
with masses 2063.18 Daltons, 3056.48 Daltons, 6492.81 Daltons, and
15 7450.14 Daltons.

B. Nickase Digestion of Pooled Samples

DQA (HLA ClassII-DQ Alpha, expected fragment size = 225bp) was amplified from the genomic DNA of 100 healthy individuals. DQA was amplified using standard PCR chemistry in a reaction having a total
20 volume of 50 μ L containing of 10 mM Tris-HCl, 10 mM KCl (pH 8.3), 2.5 mM MgCl₂, 200 μ M of each dNTP, 10 pmol of a forward primer having the sequence 5'-GTG CTG CAG GTG TAA ACT TGT ACC AG-3' (SEQ ID NO: 64), 10 pmol of a reverse primer having the sequence 5'-CAC GGA TCC GGT AGC AGC GGT AGA GTT G-3' (SEQ ID NO: 65), 1 U DNA
25 polymerase (Stoffel fragment, Perkin Elmer), and 200ng human genomic DNA (2ng DNA/individual). The template was denatured at 94°C for 5 minutes. Thermal cycling was continued with a touch-down program that included 45 cycles of 20 seconds at 94°C, 30 seconds at 56°C, 1

-85-

minute at 72°C, and a final extension of 3 minutes at 72°C. The crude PCR product was used in the subsequent nickase reaction.

The unpurified PCR product was subjected to nickase digestion. Tris-HCl (10 mM), KCl (10 mM, pH 8.3), magnesium acetate (25mM),
5 BSA (1 mg/mL), and 5 U of Cvi NY2A or Cvi NYS1 Nickase (Megabase Research) were added to 25 pmol of the amplified template with a total reaction volume of 20 μ L. The mixture was then incubated at 37°C for 5 hours. The digestion products were purified with either ZipTips (Millipore, Bedford, MA) as described in Example 5. The samples were analyzed by
10 MALDI-TOF mass spectroscopy as described in Example 4. This assay can also be used to do multiplexing and standardless genotyping as described herein.

To simplify the nickase mass spectrum, the two complementary strands can be separated after digestion by using a single-stranded
15 undigested PCR product as a capture probe. This probe (preparation shown below in Example 8C) can be hybridized to the nickase fragments in hybridization buffer containing 200 mM sodium citrate and 1% blocking reagent (Boehringer Mannheim). The reaction is heated to 95°C for 5 minutes and cooled to room temperature over 30 minutes by using a
20 thermal cycler (PTC-200 DNA engine, MJ Research, Waltham, MA). The capture probe-nickase fragment is immobilized on 140 μ g of streptavidin-coated magnetic beads. The beads are subsequently washed three times with 70 mM ammonium citrate. The captured single-stranded nickase fragments are eluted by heating to 80°C for 5 minutes in 5 μ L of 50 mM
25 ammonium hydroxide.

C. Preparation of Capture Probe

The capture probe is prepared by amplifying the human β -globin gene (3' end of intron 1 to 5' end of exon 2) via PCR methods in a total volume of 50 μ L containing of GeneAmp 1XPCR Buffer II, 10 mM Tris-

-86-

HCl, pH 8.3, 50 mM KCl, 2 mM MgCl₂, 0.2 mM dNTP mix, 10pmol of each primer (forward primer 5'-ACTGGGCATGTGGAGACAG-3'(SEQ ID NO: 66) and biotinylated reverse primer bio5'-GCACTTTCTTGCCATGAG-3'(SEQ ID: 67), 2 U of AmpliTaq Gold, and 200 ng of human genomic

5 DNA. The template is denatured at 94°C for 8 minutes. Thermal cycling is continued with a touch-down program that included 11 cycles of 20 seconds at 94°C, 30 seconds at 64°C, 1 minute at 72°C; and a final extension of 5 minutes at 72°C. The amplicon is purified using UltraClean™ PCR clean-up kit (MO Bio Laboratories, Solano Beach, CA).

10

EXAMPLE 9

Multiplex Type IIS SNP Assay

A Type IIS assay was used to identify human gene sequences with known SNPs. The Type IIS enzyme used in this assay was Fok I which

15 effected double-stranded cleavage of the target DNA. The assay involved the steps of amplification and Fok I treatment of the amplicon. In the amplification step, the primers were designed so that each PCR product of a designated gene target was less than 100 bases such that a Fok I recognition sequence was incorporated at the 5' and 3' end of the

20 amplicon. Therefore, the fragments that were cleaved by Fok I included a center fragment containing the SNP of interest.

Ten human gene targets with known SNPs were analyzed by this assay. Sequences of the ten gene targets, as well as the primers used to amplify the target regions, are found in Table 5. The ten targets were

25 lipoprotein lipase, prothrombin, factor V, cholesterol ester transfer protein (CETP), factor VII, factor XIII, HLA-H exon 2, HLA-H exon 4, methylenetetrahydrofolate reductase (MTHR), and P53 exon 4 codon 72.

Amplification of the ten human gene sequences were carried out in a single 50 µL volume PCR reaction with 20 ng of human genomic DNA

-87-

template in 5 PCR reaction tubes. Each reaction vial contained 1X PCR buffer (Qiagen), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen), 4 mM MgCl₂, and 10pmol of each primer. US8, having sequence of 5'TCAGTCACGACGTT3'(SEQ ID NO: 68), and US9, having sequence of 5'CGGATAACAATTTC3'(SEQ ID NO: 69), were used for the forward and reverse primers respectively. Moreover, the primers were designed such that a Fok I recognition site was incorporated at the 5' and 3' ends of the amplicon. Thermal cycling was performed in 0.2 mL tubes or a 96 well plate using a MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94°C for 5 minutes; 45 cycles: 94°C for 20 seconds, 56°C for 20 seconds, 72°C for 60 seconds; and 72°C for 3 minutes.

Following PCR, the sample was treated with 0.2 U Exonuclease I (Amersham Pharmacia) and S Alkaline Phosphatase (Amersham Pharmacia) to remove the unincorporated primers and dNTPs. Typically, 0.2 U of exonuclease I and SAP were added to 5 μ L of the PCR sample. The sample was then incubated at 37°C for 15 minutes. Exonuclease I and SAP were then inactivated by heating the sample up to 85°C for 15 minutes. Fok I digestion was performed by adding 2 U of Fok I (New England Biolab) to the 5 μ L PCR sample and incubating at 37°C for 30 minutes. Since the Fok I restriction sites are located on both sides of the amplicon, the 5' and 3' cutoff fragments have higher masses than the center fragment containing the SNP. The sample was then purified by anion exchange and analyzed by MALDI-TOF mass spectrometry as described in Example 4. The masses of the gene fragments from this multiplexing experiment are listed in Table 6. These gene fragments were resolved in mass spectra thereby allowing multiplex analysis of sequence variability in these genes.

Table 5
Genes for Multiplex Type IIS Assay

5

10

15

Gene	Sequence	Seq. ID No.	Primers	Seq. ID No.
Lipoprotein Lipase (Asn291Ser)	cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat <u>ctgggtatg agatca(a>g)taa agtcagagcc</u> aaaagaagca gcaaaatgta	98-99	5' caatttcacgctggatgcaatct gggctatgagatc 3'	70
			5' caatttcacacagcggatgcttct ttggctctgact 3'	71
Prothrombin	26731 gaattatitt tgtgtttcta aaactatggt tcccaataaa agtgactctc 26781 <u>agc(g>a)agccctc aatgctccca</u> gtgctattca tgggcagctc tctgggctca	100-101	5' tcagtcacgacgttggatgcca taaaagtgactctcagc 3'	72
			5' cggataacaatttcggatgcact gggagcattgagac 3'	73
Factor V (Arg506Gln)	taataggact acttctaalc tgaagagca <u>gatccctgga caggc(g>a)agga</u> <u>atcacggat tttgtccttg aagtaacctt tcag</u>	102-103	5' tcagtcacgacgttggatgagca gatccctggacagac 3'	74
			5' cggataacaatttcggatggaca aaatacctgtattcc 3'	75
Cholesterol ester transfer protein (CETP) (I405V)	1261 ctccatggt gcatttgatt <u>gcagagcage</u> <u>tccaggtcc(g>a) tccagagctt</u> 1311 <u>ctgcagctca atgatcaccg ctgtgggcat</u> ccctgagggtc atgtctcgta	104-105	5' tcagtcacgacgttggatgcaga gcagctccgagtc 3'	76
			5' cagcgggtgatcattggatgcagg aagctctgg 3'	77
Factor VII (R353Q)	1221 agcaaggact cctgcaaggg ggacagtgga ggccacatg <u>ccaccacta</u> 1271 <u>cc(a>g)gggcagc tggatcctga</u> <u>cgggcatcgt cagctggggc cagggctgcg</u>	106-107	5' tcagtcacgacgttggatgcca catgccaccactac 3'	78
			5' cggataacaatttcggatgccc tcaggatccacg 3'	79
Factor XIII (V34L)	111 caataactct aatgcagcgg aagatgacct <u>gcccacagt gaggctcagg</u> 161 gc(g>t)tggtgcc ccggggcgtc <u>aacctgcaag gtatgagcat accccccttc</u>	108-109	5' tcagtcacgacgttggatgcca cagtgagcttcag 3'	80
			5' gtcataaccttcaggatgacg 3'	81
HLA-H exon 2 (His63AAsp)	361 ttgaagcttt gggctacgtg <u>gatgaccage</u> <u>tggtcgtgtt ctatgat(c>g)at</u> 411 <u>gagagtcgcc gtgtgagacc ccgaactcca</u> tgggtttcca gtgaatttc	110-111	5' tcagtcacgacgttggatgacca gctgttcgtatc 3'	82
			5' tcagtgaggttcgggagtcaca cggcgactctc 3'	83
HLA-H exon 4 (Cys282Tyr)	1021 ggataacctt ggctgaccc cctggggaag <u>agcagagata tacgt(g>a)ccag</u> 1071 <u>gtggagcacc caggcctgga tcagcccttc</u> attgtgatct gggagccctc	112-113	5' tcagtcacgacgttggatgggga aggcagagatatacgt 3'	84
			5' ggggggctgatccaggatgggt gctccac 3'	85

-89-

5

Gene	Sequence	Seq. ID No.	Primers	Seq. ID No.
Methylentetrahydrofolate reductase (MTHFR) (Ala222Val)	761 <u>tgaagcactt gaagga gaag gtgtctgcgg</u> gaglc>tlcgattt catcatcacg	114-115	5' tcagtcacgacgttggatgggga agagcagagatatacgt 3'	86
	811 <u>cagcttttct ttgaggctga cacattcttc</u>		5' ggggggctgatccaggatgggt gctccac 3'	87
P53 Exon4 Codon 72 (Arg72Pro)	12101 <u>tccagatgaa gctcccagaa</u> tgccagagggc tgctcccc(g>c)tc gtggcccctg	116-117	5' gatgaagctcccaggatgccag aggc 3'	88
	12151 <u>caccagcagc tcctacaccg</u> gcggcccctg		5' gccgcccgtgtaggatgctgctg gtgc 3'	89

-89/a-

Table 6
The mass of Center Fragments for Ten Different SNP Typing by
IIS Assay

Gene	LPL(^{Asp} 291 ^{Ser})		Prothrombin		FV(^{Asp} 506 ^{Glu})		CETP(405 ^V)		FVII(^{Asp} 353 ^G)		FXIII(^{Val} 34)	
Genotype	A	G	G	A	G	A	G	A	G	A	G	T
+ strand mass (Da)	6213	6229	5845	5829	5677	5661	3388	3372	6128	6112	5058	5033
- strand mass (Da)	6129	6114	5949	5964	5472	5487	3437	3452	6174	6189	4916	4940

Gene	H1ah2		H1ah4		MTHR(^{Asp} 222 ^{Val})		P53exon4(^{Asp} 72 ^{Ser})	
Genotype	C	G	G	A	C	T	G	C
+ strand mass (Da)	5889	5929	4392	4376	4400	4415	4586	4546
- strand mass (Da)	5836	5796	4319	4334	4368	4352	4724	4764

-90-

EXAMPLE 10**Exemplary use of parental medical history parameter for stratification of healthy database**

A healthy database can be used to associate a disease state with a specific allele (SNP) that has been found to show a strong association between age and the allele, in particular the homozygous genotype. The method involves using the same healthy database used to identify the age dependent association, however stratification is by information given by the donors about common disorders from which their parents suffered (the donor's familial history of disease). There are three possible answers a donor could give about the health status of their parents: neither were affected, one was affected or both were affected. Only donors above a certain minimum age, depending on the disease, are utilized, as the donors parents must be old enough to to have exhibited clinical disease phenotypes. The genotype frequency in each of these groups is determined and compared with each other. If there is an association of the marker in the donor to a disease the frequency of the heterozygous genotype will be increased. The frequency of the homozygous genotype should not increase, as it should be significantly underrepresented in the healthy population.

-91-

EXAMPLE 11**Method and Device for Identifying a Biological Sample****Description**

In accordance with the present invention, a method and device for
5 identifying a biological sample is provided. Referring now to FIG. 24, an
apparatus 10 for identifying a biological sample is disclosed. The apparatus 10
for identifying a biological sample generally comprises a mass spectrometer 15
communicating with a computing device 20. In a preferred embodiment, the
mass spectrometer may be a MALDI-TOF mass spectrometer manufactured by
10 Bruker-Franzen Analytik GmbH; however, it will be appreciated that other mass
spectrometers can be substituted. The computing device 20 is preferably a
general purpose computing device. However, it will be appreciated that the
computing device could be alternatively configured, for example, it may be
integrated with the mass spectrometer or could be part of a computer in a larger
15 network system.

The apparatus 10 for identifying a biological sample may operate as an
automated identification system having a robot 25 with a robotic arm 27
configured to deliver a sample plate 29 into a receiving area 31 of the mass
spectrometer 15. In such a manner, the sample to be identified may be placed
20 on the plate 29 and automatically received into the mass spectrometer 15. The
biological sample is then processed in the mass spectrometer to generate data
indicative of the mass of DNA fragments in the biological sample. This data may
be sent directly to computing device 20, or may have some preprocessing or
filtering performed within the mass spectrometer. In a preferred embodiment,
25 the mass spectrometer 15 transmits unprocessed and unfiltered mass
spectrometry data to the computing device 20. However, it will be appreciated
that the analysis in the computing device may be adjusted to accommodate
preprocessing or filtering performed within the mass spectrometer.

Referring now to FIG. 25, a general method 35 for identifying a biological
30 sample is shown. In method 35, data is received into a computing device from a
test instrument in block 40. Preferably the data is received in a raw,
unprocessed and unfiltered form, but alternatively may have some form of

-92-

filtering or processing applied. The test instrument of a preferred embodiment is a mass spectrometer as described above. However, it will be appreciated that other test instruments could be substituted for the mass spectrometer.

The data generated by the test instrument, and in particular the mass spectrometer, includes information indicative of the identification of the biological sample. More specifically, the data is indicative of the DNA composition of the biological sample. Typically, mass spectrometry data gathered from DNA samples obtained from DNA amplification techniques are noisier than, for example, those from typical protein samples. This is due in part because protein samples are more readily prepared in more abundance, and protein samples are more easily ionizable as compared to DNA samples. Accordingly, conventional mass spectrometer data analysis techniques are generally ineffective for DNA analysis of a biological sample. To improve the analysis capability so that DNA composition data can be more readily discerned, a preferred embodiment uses wavelet technology for analyzing the DNA mass spectrometry data. Wavelets are an analytical tool for signal processing, numerical analysis, and mathematical modeling. Wavelet technology provides a basic expansion function which is applied to a data set. Using wavelet decomposition, the data set can be simultaneously analyzed in the time and frequency domains. Wavelet transformation is the technique of choice in the analysis of data that exhibit complicated time (mass) and frequency domain information, such as MALDI-TOF DNA data. Wavelet transforms as described herein have superior denoising properties as compared to conventional Fourier analysis techniques. Wavelet transformation has proven to be particularly effective in interpreting the inherently noisy MALDI-TOF spectra of DNA samples. In using wavelets, a "small wave" or "scaling function" is used to transform a data set into stages, with each stage representing a frequency component in the data set. Using wavelet transformation, mass spectrometry data can be processed, filtered, and analyzed with sufficient discrimination to be useful for identification of the DNA composition for a biological sample.

Referring again to FIG. 25, the data received in block 40 is denoised in block 45. The denoised data then has a baseline correction applied in block 50.

-93-

A baseline correction is generally necessary as data coming from the test instrument, in particular a mass spectrometer instrument, has data arranged in a generally exponentially decaying manner. This generally exponential decaying arrangement is not due to the composition of the biological sample, but is a
5 result of the physical properties and characteristics of the test instrument, and other chemicals involved in DNA sample preparation. Accordingly, baseline correction substantially corrects the data to remove a component of the data attributable to the test system, and sample preparation characteristics.

After denoising in block 45 and the baseline correction in block 50, a
10 signal remains which is generally indicative of the composition of the biological sample. However, due to the extraordinary discrimination required for analyzing the DNA composition of the biological sample, the composition is not readily apparent from the denoised and corrected signal. For example, although the signal may include peak areas, it is not yet clear whether these "putative" peaks
15 actually represent a DNA composition, or whether the putative peaks are result of a systemic or chemical aberration. Further, any call of the composition of the biological sample would have a probability of error which would be unacceptable for clinical or therapeutic purposes. In such critical situations, there needs to be a high degree of certainty that any call or identification of the sample is
20 accurate. Therefore, additional data processing and interpretation is necessary before the sample can be accurately and confidently identified.

Since the quantity of data resulting from each mass spectrometry test is typically thousands of data points, and an automated system may be set to perform hundreds or even thousands of tests per hour, the quantity of mass
25 spectrometry data generated is enormous. To facilitate efficient transmission and storage of the mass spectrometry data, block 55 shows that the denoised and baseline corrected data is compressed.

In a preferred embodiment, the biological sample is selected and processed to have only a limited range of possible compositions. Accordingly, it
30 is therefore known where peaks indicating composition should be located, if present. Taking advantage of knowing the location of these expected peaks, in block 60 the method 35 matches putative peaks in the processed signal to the

-94-

location of the expected peaks. In such a manner, the probability of each putative peak in the data being an actual peak indicative of the composition of the biological sample can be determined. Once the probability of each peak is determined in block 60, then in block 65 the method 35 statistically determines
5 the composition of the biological sample, and determines if confidence is high enough to calling a genotype.

Referring again to block 40, data is received from the test instrument, which is preferably a mass spectrometer. In a specific illustration, FIG. 26 shows an example of data from a mass spectrometer. The mass spectrometer
10 data 70 generally comprises data points distributed along an x-axis 71 and a y-axis 72. The x-axis 71 represents the mass of particles detected, while the y-axis 72 represents a numerical concentration of the particles. As can be seen in FIG. 26, the mass spectrometry data 70 is generally exponentially decaying with data at the left end of the x-axis 73 generally decaying in an exponential manner
15 toward data at the heavier end 74 of the x-axis 71. However, the general exponential presentation of the data is not indicative of the composition of the biological sample, but is more reflective of systematic error and characteristics. Further, as described above and illustrated in FIG. 26, considerable noise exists in the mass spectrometry DNA data 70.

Referring again to block 45, where the raw data received in block 40 is denoised, the denoising process will be described in more detail. As illustrated in FIG. 25, the denoising process generally entails 1) performing a wavelet
20 transformation on the raw data to decompose the raw data into wavelet stage coefficients; 2) generating a noise profile from the highest stage of wavelet coefficients; and 3) applying a scaled noise profile to other stages in the wavelet
25 transformation. Each step of the denoising process is further described below.

Referring now to FIG. 27, the wavelet transformation of the raw mass spectrometry data is generally diagramed. Using wavelet transformation techniques, the mass spectrometry data 70 is sequentially transformed into
30 stages. In each stage the data is represented in a high stage and a low stage, with the low stage acting as the input to the next sequential stage. For example, the mass spectrometry data 70 is transformed into stage 0 high data

-95-

82 and stage 0 low data 83. The stage 0 low data 83 is then used as an input to the next level transformation to generate stage 1 high data 84 and stage 1 low data 85. In a similar manner, the stage 1 low data 85 is used as an input to be transformed into stage 2 high data 86 and stage 2 low data 87. The

5 transformation is continued until no more useful information can be derived by further wavelet transformation. For example, in the preferred embodiment a 24-point wavelet is used. More particularly a wavelet commonly referred to as the Daubechies 24 is used to decompose the raw data. However, it will be appreciated that other wavelets can be used for the wavelet transformation.

10 Since each stage in a wavelet transformation has one-half the data points of the previous stage, the wavelet transformation can be continued until the stage n low data 89 has around 50 points. Accordingly, the stage n high 88 would contain about 100 data points. Since the preferred wavelet is 24 points long, little data or information can be derived by continuing the wavelet transformation

15 on a data set of around 50 points.

FIG. 28 shows an example of stage 0 high data 95. Since stage 0 high data 95 is generally indicative of the highest frequencies in the mass spectrometry data, stage 0 high data 95 will closely relate to the quantity of high frequency noise in the mass spectrometry data. In FIG. 29, an exponential

20 fitting formula has been applied to the stage 0 high data 95 to generate a stage 0 noise profile 97. In particular, the exponential fitting formula is in the format $A_0 + A_1 \text{EXP}(-A_2 m)$. It will be appreciated that other expediential fitting formulas or other types of curve fits may be used.

Referring now to FIG. 30, noise profiles for the other high stages are

25 determined. Since the later data points in each stage will likely be representative of the level of noise in each stage, only the later data points in each stage are used to generate a standard deviation figure that is representative of the noise content in that particular stage. More particularly, in generating the noise profile for each remaining stage, only the last five percent of the data points in each

30 stage are analyzed to determined a standard deviation number. It will be appreciated that other numbers of points, or alternative methods could be used to generate such a standard deviation figure.

-96-

The standard deviation number for each stage is used with the stage 0 noise profile (the exponential curve) 97 to generate a scaled noise profile for each stage. For example, FIG. 30 shows that stage 1 high data 98 has stage 1 high data 103 with the last five percent of the data points represented by area 99. The points in area 99 are evaluated to determine a standard deviation number indicative of the noise content in stage 1 high data 103. The standard deviation number is then used with the stage 0 noise profile 97 to generate a stage 1 noise profile.

In a similar manner, stage 2 high 100 has stage 2 high data 104 with the last five percent of points represented by area 101. The data points in area 101 are then used to calculate a standard deviation number which is then used to scale the stage 0 noise profile 97 to generate a noise profile for stage 2 data. This same process is continued for each of the stage high data as shown by the stage n high 105. For stage n high 105, stage n high data 108 has the last five percent of data points indicated in area 106. The data points in area 106 are used to determine a standard deviation number for stage n. The stage n standard deviation number is then used with the stage 0 noise profile 97 to generate a noise profile for stage n. Accordingly, each of the high data stages has a noise profile.

FIG. 31 shows how the noise profile is applied to the data in each stage. Generally, the noise profile is used to generate a threshold which is applied to the data in each stage. Since the noise profile is already scaled to adjust for the noise content of each stage, calculating a threshold permits further adjustment to tune the quantity of noise removed. Wavelet coefficients below the threshold are ignored while those above the threshold are retained. Accordingly, the remaining data has a substantial portion of the noise content removed.

Due to the characteristics of wavelet transformation, the lower stages, such as stage 0 and 1, will have more noise content than the later stages such as stage 2 or stage n. Indeed, stage n low data is likely to have little noise at all. Therefore, in a preferred embodiment the noise profiles are applied more aggressively in the lower stages and less aggressively in the later stages. For example, FIG. 31 shows that stage 0 high threshold is determined by multiplying

-97-

the stage 0 noise profile by a factor of four. In such a manner, significant numbers of data points in stage 0 high data 95 will be below the threshold and therefore eliminated. Stage 1 high threshold 112 is set at two times the noise profile for the stage 1 high data, and stage 2 high threshold 114 is set equal to the noise profile for stage 2 high. Following this geometric progression, stage n high threshold 116 is therefore determined by scaling the noise profile for each respective stage n high by a factor equal to $(1/2^{n-2})$. It will be appreciated that other factors may be applied to scale the noise profile for each stage. For example, the noise profile may be scaled more or less aggressively to accommodate specific systemic characteristics or sample compositions. As indicated above, stage n low data does not have a noise profile applied as stage n low data 118 is assumed to have little or no noise content. After the scaled noise profiles have been applied to each high data stage, the mass spectrometry data 70 has been denoised and is ready for further processing. A wavelet transformation of the denoised signal results in the sparse data set 120 as shown in FIG. 31.

Referring again to FIG. 25, the mass spectrometry data received in block 40 has been denoised in block 45 and is now passed to block 50 for baseline correction. Before performing baseline correction, the artifacts introduced by the wavelet transformation procedure are preferably removed. Wavelet transformation results vary slightly depending upon which point of the wavelet is used as a starting point. For example, the preferred embodiment uses the 24-point Daubechies-24 wavelet. By starting the transformation at the 0 point of the wavelet, a slightly different result will be obtained than if starting at points 1 or 2 of the wavelet. Therefore, the denoised data is transformed using every available possible starting point, with the results averaged to determine a final denoised and shifted signal. For example, FIG. 33 shows that the wavelet coefficient is applied 24 different times and then the results averaged to generate the final data set. It will be appreciated that other techniques may be used to accommodate the slight error introduced due to wavelet shifting.

The formula 125 is generally indicated in FIG. 33. Once the signal has been denoised and shifted, a denoised and shifted signal 130 is generated as

-98-

shown in FIG. 58. FIG. 34 shows an example of the wavelet coefficient 135 data set from the denoised and shifted signal 130.

FIG. 36 shows that putative peak areas 145, 147, and 149 are located in the denoised and shifted signal 150. The putative peak areas are systematically
5 identified by taking a moving average along the signal 150 and identifying sections of the signal 150 which exceed a threshold related to the moving average. It will be appreciated that other methods can be used to identify putative peak areas in the signal 150.

Putative peak areas 145, 147 and 149 are removed from the signal 150
10 to create a peak-free signal 155 as shown in FIG. 37. The peak-free signal 155 is further analyzed to identify remaining minimum values 157, and the remaining minimum values 157 are connected to generate the peak-free signal 155.

FIG. 38 shows a process of using the peak-free signal 155 to generate a baseline 170 as shown in FIG. 39. As shown in block 162, a wavelet
15 transformation is performed on the peak-free signal 155. All the stages from the wavelet transformation are eliminated in block 164 except for the n low stage. The n low stage will generally indicate the lowest frequency component of the peak-free signal 155 and therefore will generally indicate the system exponential characteristics. Block 166 shows that a signal is reconstructed from the n low
20 coefficients and the baseline signal 170 is generated in block 168.

FIG. 39 shows a denoised and shifted data signal 172 positioned adjacent a correction baseline 170. The baseline correction 170 is subtracted from the denoised and shifted signal 172 to generate a signal 175 having a baseline correction applied as shown in FIG. 40. Although such a denoised, shifted, and
25 corrected signal is sufficient for most identification purposes, the putative peaks in signal 175 are not identifiable with sufficient accuracy or confidence to call the DNA composition of a biological sample.

Referring again to FIG. 25, the data from the baseline correction 50 is now compressed in block 55, the compression technique used in a preferred
30 embodiment is detailed in FIG. 41. In FIG. 41 the data in the baseline corrected data is presented in an array format 182 with x-axis points 183 having an associated data value 184. The x-axis is indexed by the non-zero wavelet

-99-

coefficients, and the associated value is the value of the wavelet coefficient. In the illustrated data example in table 182, the maximum value 184 is indicated to be 1000. Although a particularly advantageous compression technique for mass spectrometry data is shown, it will be appreciated that other compression techniques can be used. Although not preferred, the data may also be stored without compression.

In compressing the data according to a preferred embodiment, an intermediate format 186 is generated. The intermediate format 186 generally comprises a real number having a whole number portion 188 and a decimal portion 190. The whole number portion is the x-axis point 183 while the decimal portion is the value data 184 divided by the maximum data value. For example, in the data 182 a data value "25" is indicated at x-axis point "100". The intermediate value for this data point would be "100.025".

From the intermediate compressed data 186 the final compressed data 195 is generated. The first point of the intermediate data file becomes the starting point for the compressed data. Thereafter each data point in the compressed data 195 is calculated as follows: the whole number portion (left of the decimal) is replaced by the difference between the current and the last whole number. The remainder (right of the decimal) remains intact. For example, the starting point of the compressed data 195 is shown to be the same as the intermediate data point which is "100.025". The comparison between the first intermediate data point "100.025" and the second intermediate data point "150.220" is "50.220". Therefore, "50.220" becomes the second point of the compressed data 195. In a similar manner, the second intermediate point is "150.220" and the third intermediate data point is "500.0001". Therefore, the third compressed data becomes "350.000". The calculation for determining compressed data points is continued until the entire array of data points is converted to a single array of real numbers.

FIG. 42 generally describes the method of compressing mass spectrometry data, showing that the data file in block 201 is presented as an array of coefficients in block 202. The data starting point and maximum is determined as shown in block 203, and the intermediate real numbers are

-100-

calculated in block 204 as described above. With the intermediate data points generated, the compressed data is generated in block 205. The described compression method is highly advantageous and efficient for compressing data sets such as a processed data set from a mass spectrometry instrument. The method is particularly useful for data, such as mass spectrometry data, that uses large numbers and has been processed to have occasional lengthy gaps in x-axis data. Accordingly, an x-y data array for processed mass spectrometry data may be stored with an effective compression rate of 10x or more. Although the compression technique is applied to mass spectrometry data, it will be appreciated that the method may also advantageously be applied to other data sets.

Referring again to FIG. 25, peak heights are now determined in block 60. The first step in determining peak height is illustrated in FIG. 43 where the signal 210 is shifted left or right to correspond with the position of expected peaks. As the set of possible compositions in the biological sample is known before the mass spectrometry data is generated, the possible positioning of expected peaks is already known. These possible peaks are referred to as expected peaks, such as expected peaks 212, 214, and 216. Due to calibration or other errors in the test instrument data, the entire signal may be shifted left or right from its actual position, therefore, putative peaks located in the signal, such as putative peaks 218, 222, and 224 may be compared to the expected peaks 212, 214, and 216, respectively. The entire signal is then shifted such that the putative peaks align more closely with the expected peaks.

Once the putative peaks have been shifted to match expected peaks, the strongest putative peak is identified in FIG. 44. In a preferred embodiment, the strongest peak is calculated as a combination of analyzing the overall peak height and area beneath the peak. For example, a moderately high but wide peak would be stronger than a very high peak that is extremely narrow. With the strongest putative peak identified, such as putative peak 225, a Gaussian 228 curve is fit to the peak 225. Once the Gaussian is fit, the width (W) of the Gaussian is determined and will be used as the peak width for future calculations.

-101-

As generally addressed above, the denoised, shifted, and baseline-corrected signal is not sufficiently processed for confidently calling the DNA composition of the biological sample. For example, although the baseline has generally been removed, there are still residual baseline effects present. These residual baseline effects are therefore removed to increase the accuracy and confidence in making identifications.

To remove the residual baseline effects, FIG. 45 shows that the putative peaks 218, 222, and 224 are removed from the baseline corrected signal. The peaks are removed by identifying a center line 230, 232, and 234 of the putative peaks 218, 222, and 224, respectively and removing an area to the left and to the right of the identified center line. For each putative peak, an area equal to twice the width (W) of the Gaussian is removed from the left of the center line, while an area equivalent to 50 daltons is removed from the right of the center line. It has been found that the area representing 50 daltons is adequate to sufficiently remove the effect of salt adducts which may be associated with an actual peak. Such adducts appear to the right of an actual peak and are a natural effect from the chemistry involved in acquiring a mass spectrum. Although a 50 Dalton buffer has been selected, it will be appreciated that other ranges or methods can be used to reduce or eliminate adduct effects.

The peaks are removed and remaining minima 247 located as shown in FIG. 46 with the minima 247 connected to create signal 245. A quartic polynomial is applied to signal 245 to generate a residual baseline 250 as shown in FIG. 47. The residual baseline 250 is subtracted from the signal 225 to generate the final signal 255 as indicated in FIG. 48. Although the residual baseline is the result of a quartic fit to signal 245, it will be appreciated that other techniques can be used to smooth or fit the residual baseline.

To determine peak height, as shown in FIG. 49, a Gaussian such as Gaussian 266, 268, and 270 is fit to each of the peaks, such as peaks 260, 262, and 264, respectively. Accordingly, the height of the Gaussian is determined as height 272, 274, and 276. Once the height of each Gaussian peak is determined, then the method of identifying a biological compound can move into the genotyping phase 65 as shown in FIG. 25.

-102-

An indication of the confidence that each putative peak is an actual peak can be discerned by calculating a signal-to-noise ratio for each putative peak. Accordingly, putative peaks with a strong signal-to-noise ratio are generally more likely to be an actual peak than a putative peak with a lower signal-to-noise ratio. As described above and shown in FIG. 50, the height of each peak, such as height 272, 274, and 276, is determined for each peak, with the height being an indicator of signal strength for each peak. The noise profile, such as noise profile 97, is extrapolated into noise profile 280 across the identified peaks. At the center line of each of the peaks, a noise value is determined, such as noise value 282, 283, and 284. With a signal values and a noise values generated, signal-to-noise ratios can be calculated for each peak. For example, the signal-to-noise ratio for the first peak in FIG. 50 would be calculated as signal value 272 divided by noise value 282, and in a similar manner the signal-to-noise ratio of the middle peak in FIG. 50 would be determined as signal 274 divided by noise value 283.

Although the signal-to-noise ratio is generally a useful indicator of the presence of an actual peak, further processing has been found to increase the confidence by which a sample can be identified. For example, the signal-to-noise ratio for each peak in the preferred embodiment is preferably adjusted by the goodness of fit between a Gaussian and each putative peak. It is a characteristic of a mass spectrometer that sample material is detected in a manner that generally complies with a normal distribution. Accordingly, greater confidence will be associated with a putative signal having a Gaussian shape than a signal that has a less normal distribution. The error resulting from having a non-Gaussian shape can be referred to as a "residual error".

Referring to FIG. 51, a residual error is calculated by taking a root mean square calculation between the Gaussian 293 and the putative peak 290 in the data signal. The calculation is performed on data within one width on either side of a center line of the Gaussian. The residual error is calculated as:

where G is the Gaussian signal value, R is the putative peak value, and N is the number of points from $-W$ to $+W$. The calculated residual error is used to generate an adjusted signal-to-noise ratio, as described below.

-103-

An adjusted signal noise ratio is calculated for each putative peak using the formula $(S/N) * \exp(-.1 * R)$, where S/N is the signal-to-noise ratio, and R is the residual error determined above. Although the preferred embodiment calculates an adjusted signal-to-noise ratio using a residual error for each peak, it will be appreciated that other techniques can be used to account for the goodness of fit between the Gaussian and the actual signal.

Referring now to FIG. 52, a probability is determined that a putative peak is an actual peak. In making the determination of peak probability, a probability profile 300 is generated where the adjusted signal-to-noise ratio is the x-axis and the probability is the y-axis. Probability is necessarily in the range between a 0% probability and a 100% probability, which is indicated as 1. Generally, the higher the adjusted signal-to-noise ratio, the greater the confidence that a putative peak is an actual peak.

At some target value for the adjusted signal-to-noise, it has been found that the probability is 100% that the putative peak is an actual peak and can confidently be used to identify the DNA composition of a biological sample. However, the target value of adjusted signal-to-noise ratio where the probability is assumed to be 100% is a variable parameter which is to be set according to application specific criteria. For example, the target signal-to-noise ratio will be adjusted depending upon trial experience, sample characteristics, and the acceptable error tolerance in the overall system. More specifically, for situations requiring a conservative approach where error cannot be tolerated, the target adjusted signal-to-noise ratio can be set to, for example, 10 and higher. Accordingly, 100% probability will not be assigned to a peak unless the adjusted signal-to-noise ratio is 10 or over.

In other situations, a more aggressive approach may be taken as sample data is more pronounced or the risk of error may be reduced. In such a situation, the system may be set to assume a 100% probability with a 5 or greater target signal-to-noise ratio. Of course, an intermediate signal-to-noise ratio target figure can be selected, such as 7, when a moderate risk of error can be assumed. Once the target adjusted signal-to-noise ratio is set for the method,

-104-

then for any adjusted signal-to-noise ratio a probability can be determined that a putative peak is an actual peak.

Due to the chemistry involved in performing an identification test, especially a mass spectrometry test of a sample prepared by DNA amplifications, the allelic ratio between the signal strength of the highest peak and the signal strength of the second (or third and so on) highest peak should fall within an expected ratio. If the allelic ratio falls outside of normal guidelines, the preferred embodiment imposes an allelic ratio penalty to the probability. For example, FIG. 53 shows an allelic penalty 315 which has an x-axis 317 that is the ratio between the signal strength of the second highest peak divided by signal strength of the highest peak. The y-axis 319 assigns a penalty between 0 and 1 depending on the determined allelic ratio. In the preferred embodiment, it is assumed that allelic ratios over 30% are within the expected range and therefore no penalty is applied. Between a ratio of 10% and 30%, the penalty is linearly increased until at allelic ratios below 10% it is assumed the second-highest peak is not real. For allelic ratios between 10% and 30%, the allelic penalty chart 315 is used to determine a penalty 319, which is multiplied by the peak probability determined in FIG. 52 to determine a final peak probability. Although the preferred embodiment incorporates an allelic ratio penalty to account for a possible chemistry error, it will be appreciated that other techniques may be used. Similar treatment will be applied to the other peaks.

With the peak probability of each peak determined, the statistical probability for various composition components may be determined. As an example, in order to determine the probability of each of three possible combinations of two peaks, -- peak G, peak C and combinations GG, CC and GC. FIG. 54 shows an example where a most probable peak 325 is determined to have a final peak probability of 90%. Peak 325 is positioned such that it represents a G component in the biological sample. Accordingly, it can be maintained that there is a 90% probability that G exists in the biological sample. Also in the example shown in FIG. 54, the second highest probability is peak 330 which has a peak probability of 20%. Peak 330 is at a position associated

-105-

with a C composition. Accordingly, it can be maintained that there is a 20% probability that C exists in the biological sample.

With the probability of G existing (90%) and the probability of C existing (20%) as a starting point, the probability of combinations of G and C existing can be calculated. For example, FIG. 54 indicates that the probability of GG existing 329 is calculated as 72%. This is calculated as the probability of GG is equal to the probability of G existing (90%) multiplied by the probability of C not existing (100% - 20%). So if the probability of G existing is 90% and the probability of C not existing is 80%, the probability of GG is 72%.

In a similar manner, the probability of CC existing is equivalent to the probability of C existing (20%) multiplied by the probability of G not existing (100% - 90%). As shown in FIG. 54, the probability of C existing is 20% while the probability of G not existing is 10%, so therefore the probability of CC is only 2%. Finally, the probability of GC existing is equal to the probability of G existing (90%) multiplied by the probability of C existing (20%). So if the probability of G existing is 90% and the probability of C existing is 20%, the probability of GC existing is 18%. In summary form, then, the probability of the composition of the biological sample is:

probability of GG: 72%;
probability of GC: 18%; and
probability of CC: 2%.

Once the probabilities of each of the possible combinations has been determined, FIG. 55 is used to decide whether or not sufficient confidence exists to call the genotype. FIG. 55 shows a call chart 335 which has an x-axis 337 which is the ratio of the highest combination probability to the second highest combination probability. The y-axis 339 simply indicates whether the ratio is sufficiently high to justify calling the genotype. The value of the ratio may be indicated by M 340. The value of M is set depending upon trial data, sample composition, and the ability to accept error. For example, the value M may be set relatively high, such as to a value 4 so that the highest probability must be at least four times greater than the second highest probability before confidence is established to call a genotype. However, if a certain level of error may be

-106-

acceptable, the value of M may be set to a more aggressive value, such as to 3, so that the ratio between the highest and second highest probabilities needs to be only a ratio of 3 or higher. Of course, moderate value may be selected for M when a moderate risk can be accepted. Using the example of FIG. 54, where
5 the probability of GG was 72% and the probability of GC was 18%, the ratio between 72% and 18% is 4.0, therefore, whether M is set to 3, 3.5, or 4, the system would call the genotype as GG. Although the preferred embodiment uses a ratio between the two highest peak probabilities to determine if a genotype confidently can be called, it will be appreciated that other methods
10 may be substituted. It will also be appreciated that the above techniques may be used for calculating probabilities and choosing genotypes (or more general DNA patterns) containing of combinations of more than two peaks.

Referring now to FIG. 56, a flow chart is shown generally defining the process of statistically calling genotype described above. In FIG. 56 block 402
15 shows that the height of each peak is determined and that in block 404 a noise profile is extrapolated for each peak. The signal is determined from the height of each peak in block 406 and the noise for each peak is determined using the noise profile in block 408. In block 410, the signal-to-noise ratio is calculated for each peak. To account for a non-Gaussian peak shape, a residual error is
20 determined in block 412 and an adjusted signal-to-noise ratio is calculated in block 414. Block 416 shows that a probability profile is developed, with the probability of each peak existing found in block 418. An allelic penalty may be applied in block 420, with the allelic penalty applied to the adjusted peak probability in block 422. The probability of each combination of components is
25 calculated in block 424 with the ratio between the two highest probabilities being determined in block 426. If the ratio of probabilities exceeds a threshold value then the genotype is called in block 428.

In another embodiment of the invention, the computing device 20 (Fig.
30 24) supports "standardless" genotyping by identifying data peaks that contain putative SNPs. Standardless genotyping is used, for example, where insufficient information is known about the samples to determine a distribution of expected

-107-

peak locations, against which an allelic penalty as described above can be reliably calculated. This permits the computing device to be used for identification of peaks that contain putative SNPs from data generated by any assay that fragments a targeted DNA molecule. For such standardless
5 genotyping, peaks that are associated with an area under the data curve that deviates significantly from the typical area of other peaks in the data spectrum are identified and their corresponding mass (location along the x-axis) is determined.

More particularly, peaks that deviate significantly from the average area
10 of other peaks in the data are identified, and the expected allelic ratio between data peaks is defined in terms of the ratio of the area under the data peaks. Theoretically, where each genetic loci has the same molar concentration of analyte, the area under each corresponding peak should be the same, thus producing a 1.0 ratio of the peak area between any two peaks. In accordance
15 with the invention, peaks having a smaller ratio relative to the other peaks in the data will not be recognized as peaks. More particularly, peaks having an area ratio smaller than 30% relative to a nominal value for peak area will be assigned an allelic penalty. The mass of the remaining peaks (their location along the x-axis of the data) will be determined based on oligonucleotide standards.

20 Fig. 57 shows a flow diagram representation of the processing by the computing device 20 (Fig. 24) when performing standardless genotyping. In the first operation, represented by the flow diagram box numbered 502, the computing device receives data from the mass spectrometer. Next, the height of each putative peak in the data sample is determined, as indicated by the block
25 504. After the height of each peak in the mass spectrometer data is determined, a de-noise process 505 is performed, beginning with an extrapolation of the noise profile (block 506), followed by finding the noise of each peak (block 508) and calculating the signal to noise ratio for each data sample (block 510). Each of these operations may be performed in accordance
30 with the description above for denoise operations 45 of Fig. 25. Other suitable denoise operations will occur to those skilled in the art.

-108-

The next operation is to find the residual error associated with each data point. This is represented by the block 512 in Figure 57. The next step, block 514, involves calculating an adjusted signal to noise ratio for each identified peak. A probability profile is developed next (block 516), followed by a
5 determination of the peak probabilities at block 518. In the preferred embodiment, the denoise operations of Fig. 57, comprising block 502 to block 518, comprise the corresponding operations described above in conjunction with Fig. 56 for block 402 through block 418, respectively.

The next action for the standardless genotype processing is to determine
10 an allelic penalty for each peak, indicated by the block 524. As noted above, the standardless genotype processing of Fig. 57 determines an allelic penalty by comparing area under the peaks. Therefore, rather than compare signal strength ratios to determine an allelic penalty, such as described above for Fig. 53, the standardless processing determines the area under each of the identified peaks
15 and compares the ratio of those areas. Determining the area under each peak may be computed using conventional numerical analysis techniques for calculating the area under a curve for experimental data.

Thus, the allelic penalty is assigned in accordance with Fig. 58, which shows that no penalty is assigned to peaks having a peak area relative to an
20 expected average area value that is greater than 0.30 (30%). The allelic penalty is applied to the peak probability value, which may be determined according to the process such as described in Fig. 52. It should be apparent from Fig. 58 that the allelic penalty imposed for peaks below a ratio of 30% is that such peaks will be removed from further measurement and processing. Other penalty
25 schemes, however, may be imposed in accordance with knowledge about the data being processed, as determined by those skilled in the art.

After the allelic penalty has been determined and applied, the standardless genotype processing compares the location of the remaining putative peaks to oligonucleotide standards to determine corresponding masses
30 in the processing for block 524. For standardless genotype data, the processing of the block 524 is performed to determine mass and genotype, rather than performing the operations corresponding to block 424, 426, and 428 of Fig. 33.

-109-

Techniques for performing such comparisons and determining mass will be known to those skilled in the art.

In another embodiment, the computing device 20 (Fig. 24) permits the detection and determination of the mass (location along the x-axis of the data) of the sense and antisense strand of fragments generated in the assay. If desired, the computing device may also detect and determine the quantity (area under each peak) of the respective sense and antisense strands, using a similar technique to that described above for standardless genotype processing. The data generated for each type of strand may then be combined to achieve a data redundancy and to thereby increase the confidence level of the determined genotype. This technique obviates primer peaks that are often observed in data from other diagnostic methods, thereby permitting a higher level of multiplexing. In addition, when quantitation is used in pooling experiments, the ratio of the measured peak areas is more reliably calculated than the peak identifying technique, due to data redundancy.

Fig. 23 is a flow diagram that illustrates the processing implemented by the computing device 20 to perform sense and antisense processing. In the first operation, represented by the flow diagram box numbered 602, the computing device receives data from the mass spectrometer. This data will include data for the sense strand and antisense strand of assay fragments. Next, the height of each putative peak in the data sample is determined, as indicated by the block 604. After the height of each peak in the mass spectrometer data is determined, a de-noise process 605 is performed, beginning with an operation that extrapolates the noise profile (block 606), followed by finding the noise of each peak (block 608) and calculating the signal to noise ratio for each data sample (block 610). Each of these operations may be performed in accordance with the description above for the denoise operations 45 of Fig. 25. Other suitable denoise operations will occur to those skilled in the art. The next operation is to find the residual error associated with each data point. This is represented by the block 612 in Figure 36.

After the residual error for the data of the sense strand and antisense strand has been performed, processing to identify the genotypes will be

-110-

performed for the sense strand and also for the antisense strand. Therefore, Fig. 23 shows that processing includes sense strand processing (block 630) and antisense strand processing (block 640). Each block 630, 640 includes processing that corresponds to adjusting the signal to noise ratio, developing a probability profile, determining an allelic penalty, adjusting the peak probability by the allelic penalty, calculating genotype probabilities, and testing genotype probability ratios, such as described above in conjunction with blocks 414 through 426 of Fig. 56. The processing of each block 630, 640 may, if desired, include standardless processing operations such as described above in conjunction with Fig. 57. The standardless processing may be included in place of or in addition to the processing operations of Fig. 56.

After the genotype probability processing is completed, the data from the sense strand and antisense strand processing is combined and compared to expected database values to obtain the benefits of data redundancy as between the sense strand and antisense strand. Those skilled in the art will understand techniques to take advantage of known data redundancies between a sense strand and antisense strand of assay fragments. This processing is represented by the block 650. After the data from the two strands is combined for processing, the genotype processing is performed (block 660) and the genotype is identified.

Since modifications will be apparent to those of skill in this art, it is intended that this invention be limited only by the scope of the appended claims.

-111-

WHAT IS CLAIMED IS:

1. A subcollection of samples from a target population, comprising:
a plurality of samples, wherein the samples are selected from the group
consisting of blood, tissue, body fluid, cell, seed, microbe, pathogen and
5 reproductive tissue samples; and
a symbology on the containers containing the samples, wherein the
symbology is representative of the source and/or history of each sample,
wherein:
the target population is a healthy population that has not been selected
10 for any disease state;
the collection comprises samples from the healthy population; and
the subcollection is obtained by sorting the collection according to
specified parameters.
2. The subcollection of claim 1, wherein the parameters are selected
15 from the group consisting of ethnicity, age, gender, height, weight, alcohol
intake, number of pregnancies, number of live births, vegetarians, type of
physical activity, state of residence and/or length of residence in a particular
state, educational level, age of parent at death, cause of parent death, former or
current smoker, length of time as a smoker, frequency of smoking, occurrence
20 of a disease in immediate family (parent, siblings, children), use of prescription
drugs and/or reason therefor, length and/or number of hospital stays and
exposure to environmental factors.
3. The subcollection of claim 1, wherein the symbology is a bar code.
4. A method of producing a database, comprising:
25 identifying healthy members of a population;
obtaining data comprising identifying information and obtaining historical
information and data relating to the identified members of the population and
their immediate family;
entering the data into a database for each member of the population and
30 associating the member and the data with an indexer.
5. The method of claim 4, further comprising:
obtaining a body tissue or body fluid sample;

-112-

analyzing the body tissue or body fluid in the sample; and
entering the results of the analysis for each member into the database
and associating each result with the indexer representative of each member.

6. A database produced by the method of claim 4.

5 7. A database produced by the method of claim 5.

8. A database, comprising:

datapoints representative of a plurality of healthy organisms from
whom biological samples are obtained,

10 wherein each datapoint is associated with data representative of
the organism type and other identifying information.

9. The database of claim 8, wherein the datapoints are answers to
questions regarding one or more of a parameters selected from the group
consisting of ethnicity, age, gender, height, weight, alcohol intake, number of
pregnancies, number of live births, vegetarians, type of physical activity, state of
15 residence and/or length of residence in a particular state, educational level, age
of parent at death, cause of parent death, former or current smoker, length of
time as a smoker, frequency of smoking, occurrence of a disease in immediate
family (parent, siblings, children), use of prescription drugs and/or reason
therefor, length and/or number of hospital stays and exposure to environmental
20 factors.

10. The database of claim 9, wherein the organisms are mammals and
the samples are body fluids or tissues.

11. The database of claim 9, wherein the samples are selected from
blood, blood fractions, cells and subcellular organelles.

25 12 The database of claim 8, further comprising,
phenotypic data from an organism.

13. The database of claim 12, wherein the data includes one of physical
characteristics, background data, medical data, and historical data.

30 14. The database of claim 8, further comprising,
genotypic data from nucleic acid obtained from an organism.

-113-

15. The database of claim 14, wherein genotypic data includes, genetic markers, non-coding regions, microsatellites, RFLPs, VNTRs, historical data of the organism, medical history, and phenotypic information.

16. The database of claim 8 that is a relational database.

5 17. The database of claim 16, wherein the data are related to an indexer datapoint representative of each organism from whom data is obtained.

18. A method of identifying polymorphisms that are candidate genetic markers, comprising:

identifying a polymorphism; and

10 identifying any pathway or gene linked to the locus of the polymorphism, wherein

the polymorphisms are identified in samples associated with a target population that comprises healthy subjects.

19. The method of claim 18, wherein the polymorphism is identified by
15 detecting the presence of target nucleic acids in a sample by a method, comprising the steps of:

a) hybridizing a first oligonucleotide to the target nucleic acid;

b) hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;

20 c) ligating the hybridized oligonucleotides; and

c) detecting hybridized first oligonucleotide by mass spectrometry as an indication of the presence of the target nucleic acid.

20. The method of claim 18, wherein the polymorphism is identified by detecting target nucleic acids in a sample by a method, comprising the steps of:

25 a) hybridizing a first oligonucleotide to the target nucleic acid and hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;

b) contacting the hybridized first and second oligonucleotides with a cleavage enzyme to form a cleavage product; and

30 c) detecting the cleavage product by mass spectrometry as an indication of the presence of the target nucleic acid.

-114-

21. The method of claim 20 wherein the samples are from subjects in a healthy database.

22. The method of claim 18, wherein the polymorphism is identified by identifying target nucleic acids in a sample by primer oligo base extension
5 (probe).

23. The method of 22, wherein primer oligo base extension, comprises:

- a) obtaining a nucleic acid molecule that contains a target nucleotide;
- b) optionally immobilizing the nucleic acid molecule onto a solid support,
10 to produce an immobilized nucleic acid molecule;
- c) hybridizing the nucleic acid molecule with a primer oligonucleotide that is complementary to the nucleic acid molecule at a site adjacent to the target nucleotide;
- d) contacting the product of step c) with a composition comprising a
15 dideoxynucleoside triphosphate or a 3'-deoxynucleoside triphosphates and a polymerase, so that only a dideoxynucleoside or 3'-deoxynucleoside triphosphate that is complementary to the target nucleotide is extended onto the primer; and
- e) detecting the extended primer, thereby identifying the target nucleotide.

20 24. The method of claim 23, wherein detection of the extended primer is effected by mass spectrometry, comprising:
ionizing and volatilizing the product of step d) ; and
detecting the extended primer by mass spectrometry, thereby identifying the target nucleotide.

25 25. The method of claim 24, wherein;
samples are presented to the mass spectrometer as arrays on chips; and
each sample occupies a volume that is about the size of the laser spot projected by the laser in a mass spectrometer used in matrix-assisted laser desorption/ionization (MALDI) spectrometry.

-115-

26. A combination, comprising:

a database containing parameters associated with a datapoint representative of a subject from whom samples are obtained, wherein the subjects are healthy; and

5 an indexed collection of the samples, wherein the index identifies the subject from whom the sample was obtained.

27 The combination of claim 26, wherein the parameter is selected from the group consisting of ethnicity, age, gender, height, weight, alcohol intake, number of pregnancies, number of live births, vegetarians, type of
10 physical activity, state of residence and/or length of residence in a particular state, educational level, age of parent at death, cause of parent death, former or current smoker, length of time as a smoker, frequency of smoking, occurrence of disease in immediate family (parent, siblings, children), use of prescription drugs and/or reason therefor, length and/or number of hospital stays and
15 ecposure to environmental factors.

28. The combination of claim 26, wherein the database further contains genotypic data for each subject.

29. The combination of claim 26, wherein the samples are blood.

30 A data storage medium, comprising the database of claim 8.

20 31. A computer system, comprising the database of claim 8.

32. A system for high throughput processing of biological samples, comprising:

a process line comprising a plurality of processing stations, each of which performs a procedure on a biological sample contained in a
25 reaction vessel;

a robotic system that transports the reaction vessel from processing station to processing station;

a data analysis system that receives test results of the process line and automatically processes the test results to make a determination
30 regarding the biological sample in the reaction vessel;

a control system that determines when the test at each processing station is complete and, in response, moves the reaction vessel to

-116-

the next test station, and continuously processes reaction vessels one after another until the control system receives a stop instruction; and

5 a database of claim 8, wherein the samples tested by the automated process line comprise samples from subjects in the database.

33. The system of claim 32, wherein one of the processing stations comprises a mass spectrometer.

34. The system of claim 32, wherein the data analysis system processes the test results by receiving test data from the mass spectrometer
10 such that the test data for a biological sample contains one or more signals, whereupon the data analysis system determines the area under the curve of each signal and normalizes the results thereof and obtains a substantially quantitative result representative of the relative amounts of components in the tested sample.

15 35. A method for high throughput processing of biological samples, the method comprising:

transporting a reaction vessel along a system of claim 32, comprising a process line having a plurality of processing stations, each of which performs a procedure on one or more biological samples
20 contained in the reaction vessel;
determining when the test procedure at each processing station is complete and, in response, moving the reaction vessel to the next processing station;
receiving test results of the process line and automatically processing the
25 test results to make a data analysis determination regarding the biological samples in the reaction vessel; and
processing reaction vessels continuously one after another until receiving a stop instruction, wherein the samples tested by the automated process line comprise samples from subjects in the database.

30 36. The method of 35, wherein one of the processing stations comprises a mass spectrometer.

-117-

37. The method of claim 36, wherein the samples are analyzed by a method comprising primer oligo base extension (probe).

38. The method of claim 37, further comprising:

processing the test results by receiving test data from the mass
5 spectrometer such that the test data for a biological sample contains one or more signals or numerical values representative of signals, whereupon the data analysis system determines the area under the curve of each signal and normalizes the results thereof and obtains a substantially quantitative result representative of the relative amounts of components in the tested sample.

10 39. The method of claim 37, wherein primer oligo base extension, comprises:

a) obtaining a nucleic acid molecule that contains a target nucleotide;

b) optionally immobilizing the nucleic acid molecule onto a solid support, to produce an immobilized nucleic acid molecule;

15 c) hybridizing the nucleic acid molecule with a primer oligonucleotide that is complementary to the nucleic acid molecule at a site adjacent to the target nucleotide;

d) contacting the product of step c) with composition comprising a dideoxynucleoside triphosphate or a 3'-deoxynucleoside triphosphates and a
20 polymerase, so that only a dideoxynucleoside or 3'-deoxynucleoside triphosphate that is complementary to the target nucleotide is extended onto the primer; and

e) detecting the primer, thereby identifying the target nucleotide.

40. The method of 39, wherein detection of the extended primer is effected by mass spectrometry, comprising:

25 ionizing and volatilizing the product of step d); and

detecting the extended primer by mass spectrometry, thereby identifying the target nucleotide.

41. The method of claim 36, wherein the target nucleic acids in the sample are detected and/or identified by a method, comprising the steps of:

30 a) hybridizing a first oligonucleotide to the target nucleic acid;

b) hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;

-118-

c) ligating then hybridized oligonucleotides; and
c) detecting hybridized first oligonucleotide by mass spectrometry as an indication of the presence of the target nucleic acid.

42. The method of claim 36, wherein the target nucleic acids in the
5 sample are detected and/or identified by a method, comprising the steps of:

a) hybridizing a first oligonucleotide to the target nucleic acid and hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;
b) contacting the hybridized first and second oligonucleotides with a
10 cleavage enzyme to form a cleavage product; and
c) detecting the cleavage product by mass spectrometry as an indication of the presence of the target nucleic acid.

43. A method of producing a database stored in a computer memory, comprising:
15 identifying healthy members of a population;
obtaining identifying and historical information and data relating to the identified members of the population;
entering the member-related data into the computer memory database for each identified member of the population and associating the member and the
20 data with an indexer.

44. The method of claim 43, further comprising:
obtaining a body tissue or body fluid sample of an identified member;
analyzing the body tissue or body fluid in the sample; and
entering the results of the analysis for each member into the computer
25 memory database and associating each result with the indexer representative of each member.

45. A database produced by the method of claim 43.

46. A database produced by the method of claim 44.

47. The database of claim 8, wherein:
30 the organisms are selected from among animals, bacteria, fungi, protozoans and parasites and

-119-

each datapoint is associated with parameters representative of the organism type and identifying information.

48. The database of claim 43, further comprising, phenotypic data regarding each subject.

5 49. The database of claim 47 that is a relational database and the parameters are the answers to the questions in the questionnaire.

50. The database of claim 8, further comprising, genotypic data of nucleic acid of the subject, wherein genotypic data includes, but is not limited to, genetic markers, non-coding regions,
10 microsatellites, restriction fragment length polymorphisms (RFLPs), variable number tandem repeats (VNTRs), historical day of the organism, the medical history of the subject, phenotypic information, and other information.

51. A database, comprising data records stored in computer memory, wherein the data records contain information that identifies healthy members of
15 a population, and also contain identifying and historical information and data relating to the identified members.

52. The database of claim 51, further comprising an index value for each identified member that associates each member of the population with the identifying and historical information and data.

20 53. A computer system, comprising the database of claim 51.

54. An automated process line, comprising the database of claim 51.

55. A method for determining a polymorphism that correlates with age, ethnicity or gender, comprising:

identifying a polymorphism; and
25 determining the frequency of the polymorphism with increasing age, with ethnicity or with gender in a healthy population.

56. A method for determining whether a polymorphism correlates with susceptibility to morbidity, early mortality, or morbidity and early mortality, comprising;

30 identifying a polymorphism; and

determining the frequency of the polymorphism with increasing age in a healthy population.

-120-

57. A high throughput method of determining frequencies of genetic variations, comprising:

selecting a healthy target population and a genetic variation to be assessed;

5 pooling a plurality of samples of biopolymers obtained from members of the population,

determining or detecting the biopolymer that comprises the variation by mass spectrometry;

obtaining a mass spectrum or a digital representation thereof; and
10 determining the frequency of the variation in the population.

58. The method of claim 57, wherein:

the variation is selected from the group consisting of an allelic variation, a post-translational modification, a nucleic modification, a label, a mass modification of a nucleic acid and methylation; and/or

15 the biopolymer is a nucleic acid, a protein, a polysaccharide, a lipid, a small organic metabolite or intermediate, wherein the concentration of biopolymer of interest is the same in each of the samples; and/or

the frequency is determined by assessing the method comprising determining the area under the peak in the mass spectrum or digital
20 representation thereof corresponding to the mass of the biopolymer comprising the genomic variation.

59. The method of claim 58, wherein the method for determining the frequency is effected by determining the ratio of the signal or the digital representation thereof to the total area of the entire mass spectrum, which is
25 corrected for background.

60. A method for discovery of a polymorphism in a population, comprising:

sorting the database of claim 8 according to a selected parameter to identify samples that match the selected parameter;

30 isolating a biopolymer from each identified sample;
optionally pooling each isolated biopolymer;
optionally amplifying the amount of biopolymer;

-121-

cleaving the pooled biopolymers to produce fragments thereof;
obtaining a mass spectrum of the resulting fragments and comparing the
mass spectrum with a control mass spectrum to identify differences between the
spectra and thereby identifying any polymorphisms; wherein:

5 the control mass spectrum is obtained from unsorted samples in the
collection or samples sorted according to a different parameter.

61. The method of claim 60, wherein cleaving is effected by contacting
the biopolymer with an enzyme.

62. The method of claim 61, wherein the enzyme is selected from the
10 group consisting of nucleotide glycosylase, a nickase and a type IIS restriction
enzyme.

63. The method of claim 60, wherein the biopolymer is a nucleic acid
or a protein.

64. The method of claim 60, wherein the the mass spectrometric
15 format is selected from among Matrix-Assisted Laser Desorption/Ionization,
Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI, Ion Cyclotron
Resonance (ICR), Fourier Transform and combinations thereof.

65. A method for discovery of a polymorphism in a population,
comprising:

20 obtaining samples of body tissue or fluid from a plurality of organisms;
isolating a biopolymer from each sample;
pooling each isolated biopolymer;

optionally amplifying the amount of biopolymer;
cleaving the pooled biopolymers to produce fragments thereof;
25 obtaining a mass spectrum of the resulting fragments;
comparing the frequency of each fragment to identify fragments present
in amounts lower than the average frequency, thereby identifying any
polymorphisms.

66. The method of claim 65, wherein cleaving is effected by contacting
30 the biopolymer with an enzyme.

-122-

67. The method of claim 66, wherein the enzyme is selected from the group consisting of nucleotide glycosylase, a nickase and a type IIS restriction enzyme.
68. The method of claim 65, wherein the biopolymer is a nucleic acid
5 or a protein.
69. The method of claim 65, wherein the the mass spectrometric format is selected from among Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI, Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof.
- 10 70. The method of claim 65, wherein the samples are obtained from healthy subjects.
71. A method of correlating a polymorphism with a parameter, comprising:
 sorting the database of claim 8 according to a selected parameter to
15 identify samples that match the selected parameter;
 isolating a biopolymer from each identified sample;
 pooling each isolated biopolymer;
 optionally amplifying the amount of biopolymer;
 determining the frequency of the polymorphism in the pooled
20 biopolymers, wherein:
 an alteration of the frequency of the polymorphism compared to a control, indicates a correlation of the polymorphism with the selected parameter; and
 the control is the frequency of the polymorphism in pooled biopolymers obtained from samples identified from an unsorted database or from a database
25 sorting according to a different parameter.
72. The method claim 71, wherein the parameter is selected from the group consisting of ethnicity, age, gender, height, weight, alcohol intake, number of pregnancies, number of live births, vegetarians, type of physical activity, state of residence and/or length of residence in a particular state,
30 educational level, age of parent at death, cause of parent death, former or current smoker, length of time as a smoker, frequency of smoking, occurrence of a disease in immediate family (parent, siblings, children), use of prescription

-123-

drugs and/or reason therefor, length and/or number of hospital stays and exposure to environmental factors.

73. The method claim 72, wherein the parameter is occurrence of disease or a particular disease in an immediate family member, thereby
5 correlating the polymorphism with the disease.

74. The method of claim 71, wherein the pooled biopolymers are pooled nucleic acid molecules.

75. The method of claim 74, wherein the polymorphism is detected by primer oligo base extension (PROBE).

10 76. The method of 75, wherein primer oligo base extension, comprises:

a) optionally immobilizing the nucleic acid molecules onto a solid support, to produce immobilized nucleic acid molecules;

b) hybridizing the nucleic acid molecules with a primer oligonucleotide
15 that is complementary to the nucleic acid molecule at a site adjacent to the polymorphism;

c) contacting the product of step c) with composition comprising a dideoxynucleoside triphosphate or a 3'-deoxynucleoside triphosphates and a polymerase, so that only a dideoxynucleoside or 3'-deoxynucleoside triphosphate
20 that is complementary to the polymorphism is extended onto the primer; and

d) detecting the extended primer, thereby detecting the polymorphism in nucleic acid molecules in the pooled nucleic acids.

77. The method of claim 76, wherein detecting is effected by mass spectrometry.

25 78. The method of claim 71, wherein the frequency is percentage of nucleic acid molecules in the pooled nucleic acids that contain the polymorphism.

79. The method of claim 78, wherein the ratio is determined by obtaining mass spectra of the pooled nucleic acids.

30 80. The method of claim 72, wherein the parameter is age, thereby correlating the polymorphism with susceptibility to morbidity, early mortality or morbidity and early mortality.

-124-

81. A method for haplotyping polymorphisms in a nucleic acid, comprising:

- (a) sorting the database of claim 8 according to a selected parameter to identify samples that match the selected parameter;
- 5 (b) isolating nucleic acid from each identified sample;
- (c) optionally pooling each isolated nucleic acid;
- (d) amplifying the amount of nucleic acid;
- (e) forming single-stranded nucleic acid and splitting each single-strand into a separate reaction vessel;
- 10 (f) contacting each single-stranded nucleic acid with an adaptor nucleic acid to form an adaptor complex;
- (g) contacting the adaptor complex with a nuclease and a ligase;
- (h) contacting the products of step (g) with a mixture that is capable of amplifying a ligated adaptor to produce an extended product;
- 15 (i) obtaining a mass spectrum of each nucleic acid resulting from step (h) and detecting a polymorphism by identifying a signal corresponding to the extended product;
- (j) repeating steps (f) through (i) utilizing an adaptor nucleic acid able to hybridize with another adapter nucleic acid that hybridizes to a different
- 20 sequence on the same strand; whereby
the polymorphisms are haplotyped by detecting more than one extended product.

82. The method of claim 1, wherein the nuclease is Fen-1.

83. A method for haplotyping polymorphisms in a population, comprising:

- sorting the database of claim 8 according to a selected parameter to identify samples that match the selected parameter;
- isolating a nucleic acid from each identified sample;
- pooling each isolated nucleic acid;
- 30 optionally amplifying the amount of nucleic acid;
- contacting the nucleic acid with at least one enzyme to produce fragments thereof;

-125-

obtaining a mass spectrum of the resulting fragments; whereby:
the polymorphisms are detected by detecting signals corresponding to the
polymorphisms; and

the polymorphisms are haplotyped by determining from the mass
5 spectrum that the polymorphisms are located on the same strand of the nucleic
acid.

84. The method of claim 83, wherein the enzyme is a nickase.

85. The method of claim 84, wherein the nickase is selected from the
group consisting of NY2A and NYS1.

10 86. A method for detecting methylated nucleotides within a nucleic
acid sample, comprising:

splitting a nucleic acid sample into separate reaction vessels;

contacting nucleic acid in one reaction vessel with bisulfite;

amplifying the nucleic acid in each reaction vessel;

15 cleaving the nucleic acids in each reaction vessel to produce fragments
thereof;

obtaining a mass spectrum of the resulting fragments from one reaction
vessel and another mass spectrum of the resulting fragments from another
reaction vessel; whereby:

20 cytosine methylation is detected by identifying a difference in signals
between the mass spectra.

87. The method of claim 86, wherein:

the step of amplifying is carried out in the presence of uracil; and

the step of cleaving is effected by a uracil glycosylase.

25 88. A method for identifying a biological sample, comprising:
generating a data set indicative of the composition of the biological
sample;

denoising the data set to generate denoised data;

deleting the baseline from the denoised data to generate an intermediate

30 data
set;

defining putative peaks for the biological sample;

-126-

- using the putative peaks to generate a residual baseline;
removing the residual baseline from the intermediate data set to generate
a corrected data set;
locating, responsive to removing the residual baseline, a probable peak in
5 the
corrected data set; and
identifying, using the located probable peak, the biological sample;
wherein the generated biological sample data set comprises data from
sense
10 strands and antisense strands of assay fragments.
89. The method according to claim 88, wherein identifying includes
combining
data from the sense strands and the antisense strands, and comparing the data
against expected sense strand and antisense strand values, to identify the
15 biological
sample.
90. The method according to claim 88, wherein identifying includes
deriving a peak probability for the probable peak, in accordance with whether the
probable peak is from sense strand data or from antisense strand data.
- 20 91. The method according to claim 88, wherein identifying includes
deriving a peak probability for the probable peak and applying an allelic penalty in
response to a
ratio between a calculated area under the probable peak and a calculated
expected average area under all peaks in the data set.
- 25 92. A method for identifying a biological sample, comprising:
generating a data set indicative of the composition of the biological
sample;
denoising the data set to generate denoised data;
deleting the baseline from the denoised data to generate an intermediate
30 data
set;

-127-

- defining putative peaks for the biological sample; using the
putative peaks to generate a residual baseline;
removing the residual baseline from the intermediate data set to generate
a
5 corrected data set;
locating, responsive to removing the residual baseline, a probable peak in
the corrected data set; and
identifying, using the located probable peak, the biological sample;
wherein identifying includes deriving a peak probability for the probable
10 peak and
applying an allelic penalty in response to a ratio between a calculated
area under the
probable peak and a calculated expected average area under all peaks in the data
set.
- 15 93. The method according to claim 92, wherein identifying includes
comparing
data from probable peaks that did not receive an applied allelic penalty to
determine their mass in accordance with oligonucleotide biological data.
- 20 94. The method according to claim 92, wherein the allelic penalty is
not applied to probable peaks whose ratio of area under the peak to the
expected area value is greater than 30%.
95. A method for detecting a polymorphism in a nucleic acid,
comprising:
amplifying a region of the nucleic acid to produce an amplicon, wherein
25 the resulting amplicon comprises one or more enzyme restriction sites;
contacting the amplicon with a restriction enzyme to produce fragments;
obtaining a mass spectrum of the resulting fragments and analyzing
signals in the mass spectrum by the method of claim 88; whereby:
the polymorphism is detected from the pattern of the signals.
- 30 96. A subcollection of samples from a target population, comprising:
a plurality of samples, wherein the samples are selected from the group
consisting of nucleic acids, fetal tissue, protein samples; and

-128-

a symbology on the containers containing the samples, wherein the symbology is representative of the source and/or history of each sample, wherein:

5 the target population is a healthy population that has not been selected for any disease state;

the collection comprises samples from the healthy population; and

the subcollection is obtained by sorting the collection according to specified parameters.

97. The combination of claim 26, wherein the samples are selected
10 selected from the group consisting of nucleic acids, fetal tissue, protein, tissue, body fluid, cell, seed, microbe, pathogen and reproductive tissue samples.

98. A combination, comprising the database of claim 8 and a mass spectrometer.

99. The combination of claim 98 that is an automated process line for
15 analyzing biological samples.

100. A system for high throughput processing of biological samples, comprising:

a database of claim 8, wherein the samples tested by the automated
process line comprise samples from subjects in the database; and
20 a mass spectrometry for analysis of biopolymers in the samples.

DNA Bank

Number of Samples	3912
-------------------	------

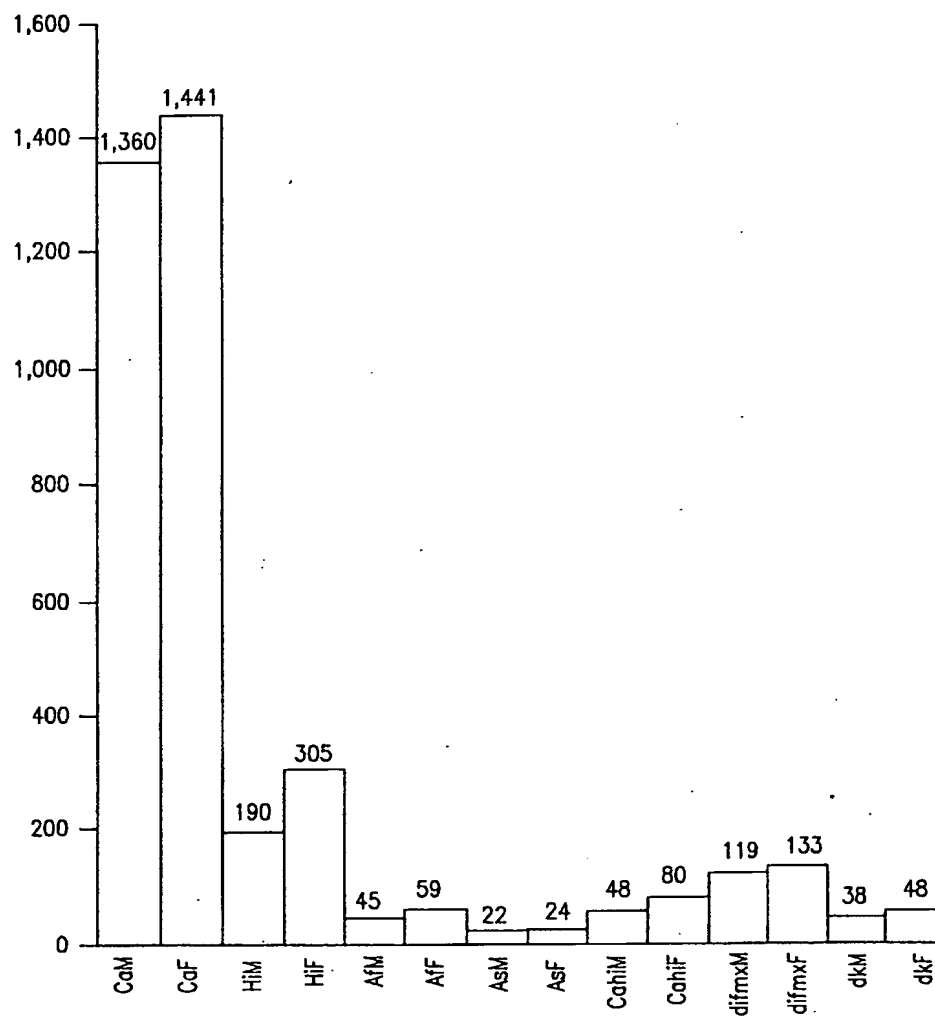


FIG. 1A

2 / 51

Caucasians

Number of Samples	2801
-------------------	------

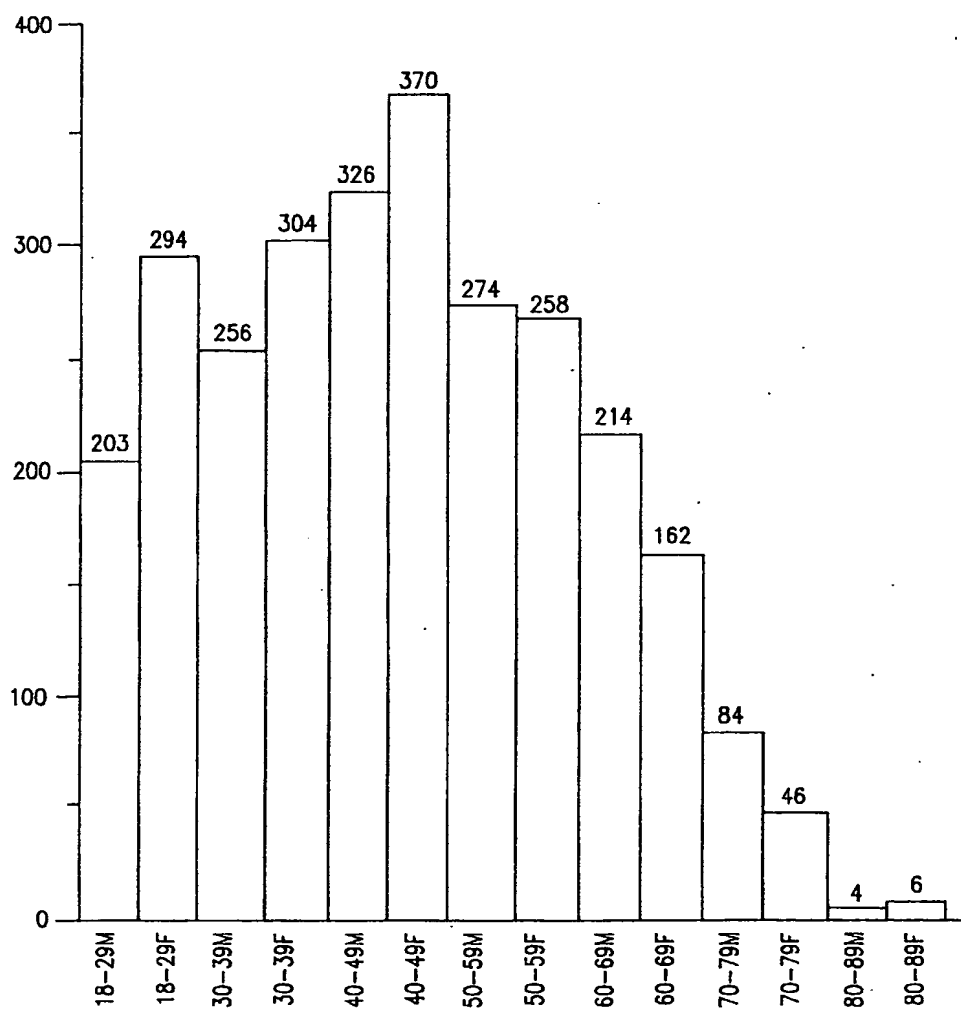


FIG. 1B

3 / 51

Hispanics

Number of Samples	495
-------------------	-----

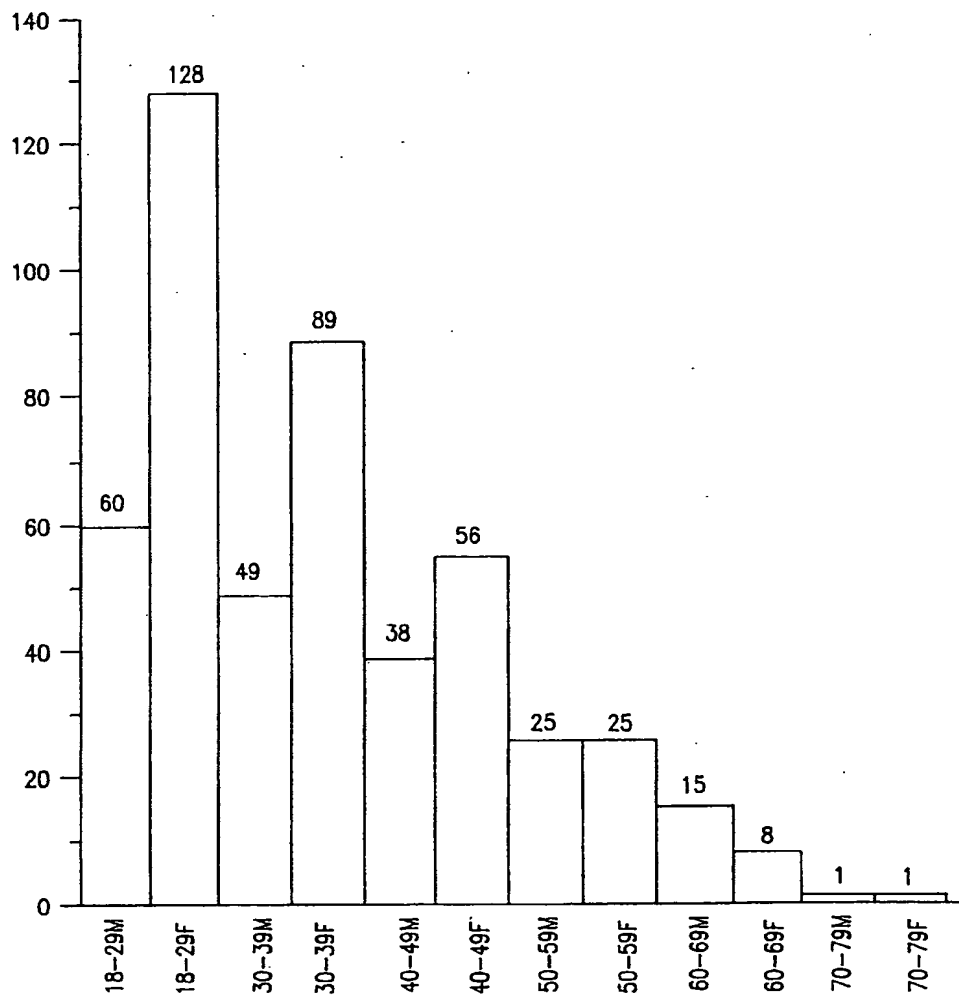
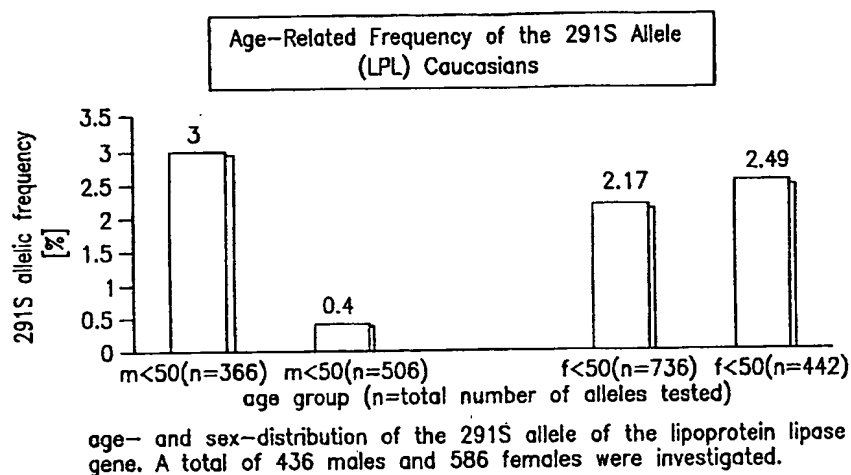
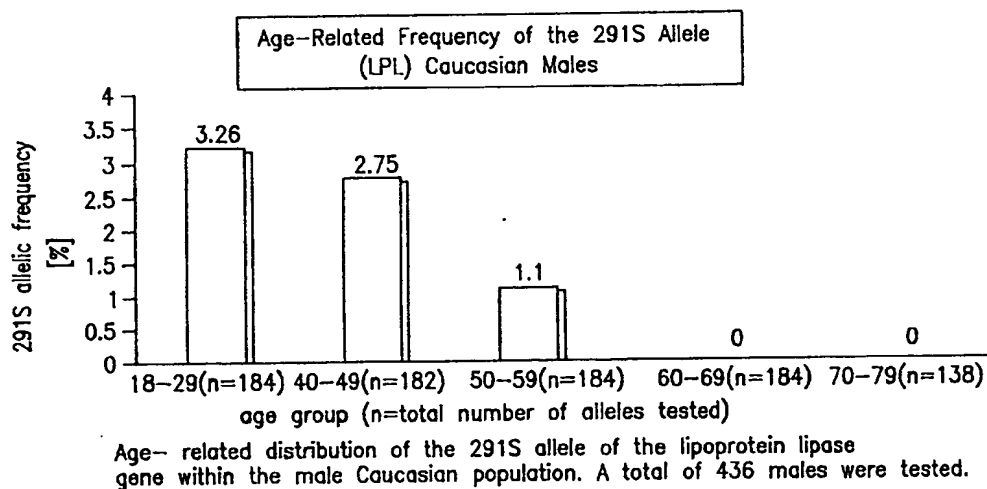


FIG. 1C

4/51

**FIG. 2A****FIG. 2B**

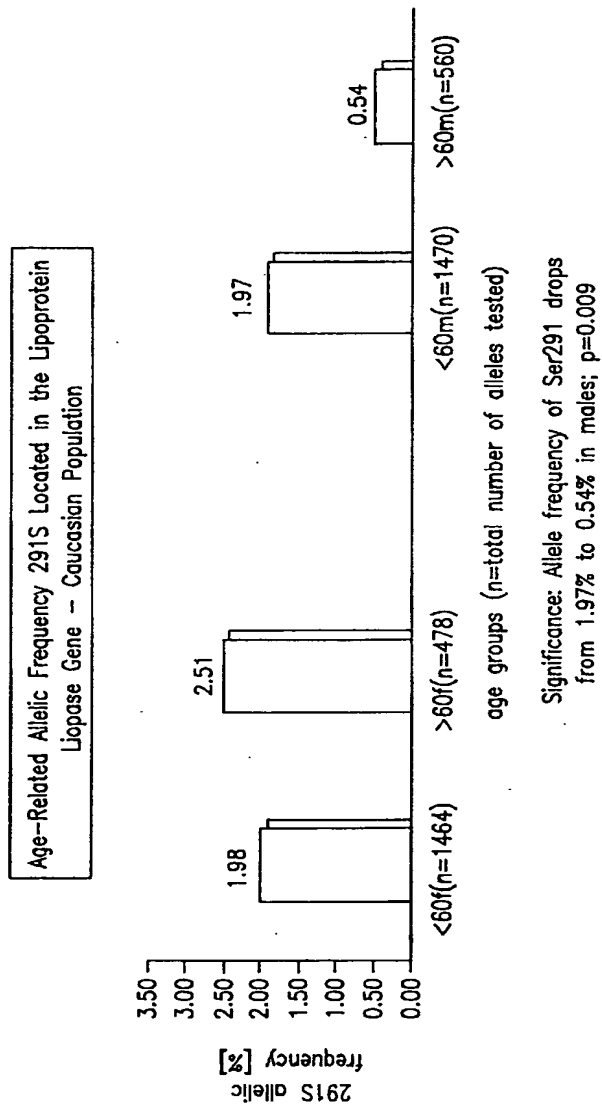


FIG. 2C

6/51

Questionnaire for
Population-Based
Sample Banking

Data Collection Form

Collection Information

Consent Form Signed Yes No

Date of Collection (MM/DD/YY)___/___/98

Time of Sample Collection(nearest hour in 24 hour clock format)_____

Initials of Data Collector_____Collecting Agency_____

(DO NOT COMPLETE: (For Date Entry Only)Sample_____intact_____lost_____broken

Affix Barcode Here

Donor information

Sex: ☐ Male ☐ Female

Date of Birth (MM/YY)___/___

In which state do you live? _____ How long have you lived there ? _____ Years

What is your highest grade you completed in school?

☐ less than 8th grade☐ 8th,9th,10th or 11th grade☐ high school graduate or equivalency☐ some college 2 yr degree☐ college graduate 4 yr degree☐ post graduate education or degree

To the best of your knowledge what is the Ethnic Origin of your:

Father

Mother

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Caucasian (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Northern Europe (Austria,Denmark,Finland,France,Germany,Netherlands,Norway,Sweden,Switzerland,U.K.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Southern Europe (Greece,Italy,Spain) |
| <input type="checkbox"/> | <input type="checkbox"/> | Eastern Europe (Czechoslovakia,Hungary,Poland,Russia,Yugoslavia) |
| <input type="checkbox"/> | <input type="checkbox"/> | Middle Eastern (Israel,Egypt,Iran,Iraq,Jordan,Syria, other Arab States) |
| <input type="checkbox"/> | <input type="checkbox"/> | African-American |
| <input type="checkbox"/> | <input type="checkbox"/> | Hispanic (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Mexico |
| <input type="checkbox"/> | <input type="checkbox"/> | Central America,South American |
| <input type="checkbox"/> | <input type="checkbox"/> | Cuba,Puerto Rico, other Caribbean |
| <input type="checkbox"/> | <input type="checkbox"/> | Asian (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Japanese |
| <input type="checkbox"/> | <input type="checkbox"/> | Chinese |
| <input type="checkbox"/> | <input type="checkbox"/> | Korean |
| <input type="checkbox"/> | <input type="checkbox"/> | Vietnamese |
| <input type="checkbox"/> | <input type="checkbox"/> | other Asian |
| <input type="checkbox"/> | <input type="checkbox"/> | Other _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Don't know |

Health information: Have you or has anyone in your immediate family(parents,brothers,sisters, or your children)
had the following? Check all that apply

Disease:

You Mother Father Sister Brother Child

Heart Disease Stroke or Arteriosclerosis
Cancer (Specify type if known)
Alzheimer's Disease or Dementia
Chronic inflammatory or Autoimmune Disease
Nervous System Disease like Multiple Sclerosis
Other (please specify)

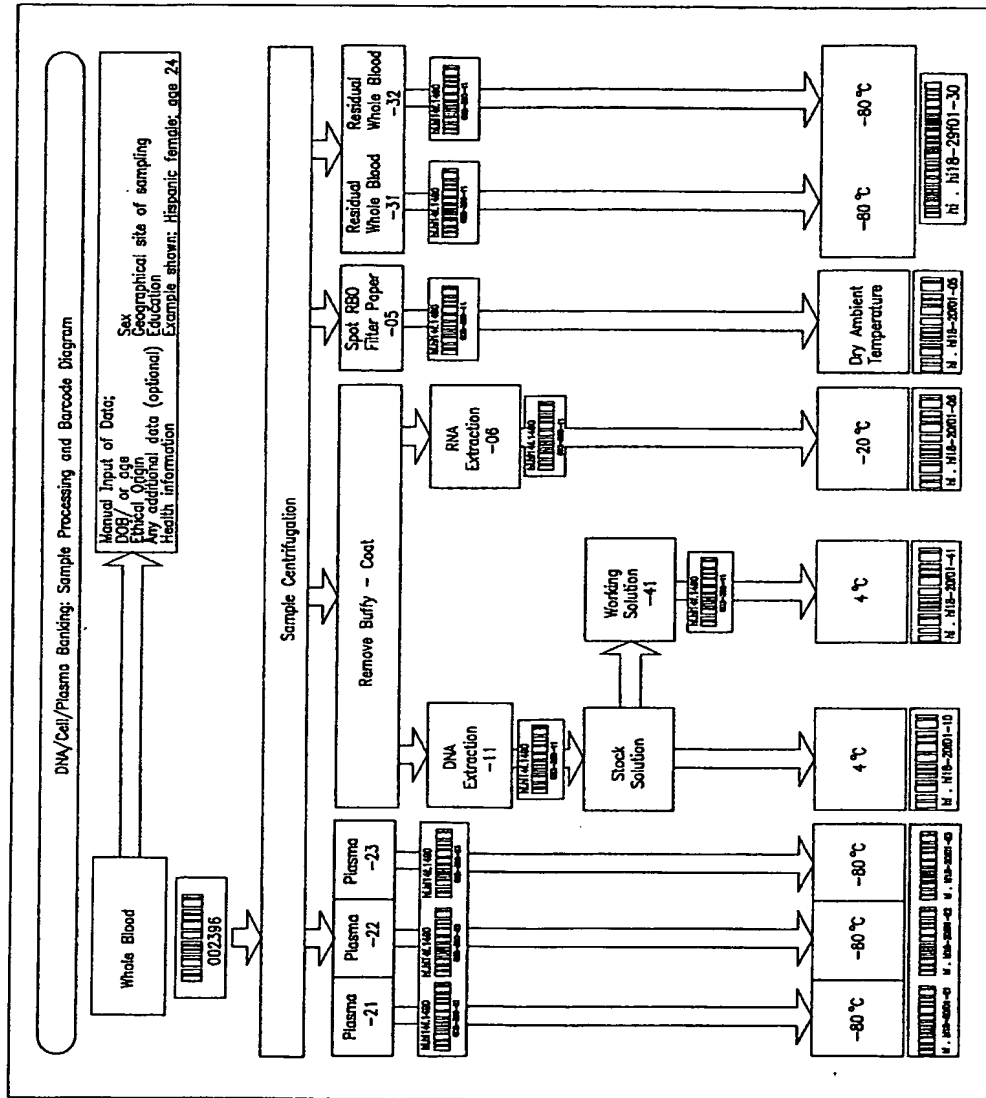
Additional health information details you would like to provide:

FIG. 3

SUBSTITUTE SHEET (RULE 26)

7/51

Sample Banks



৭৬৮

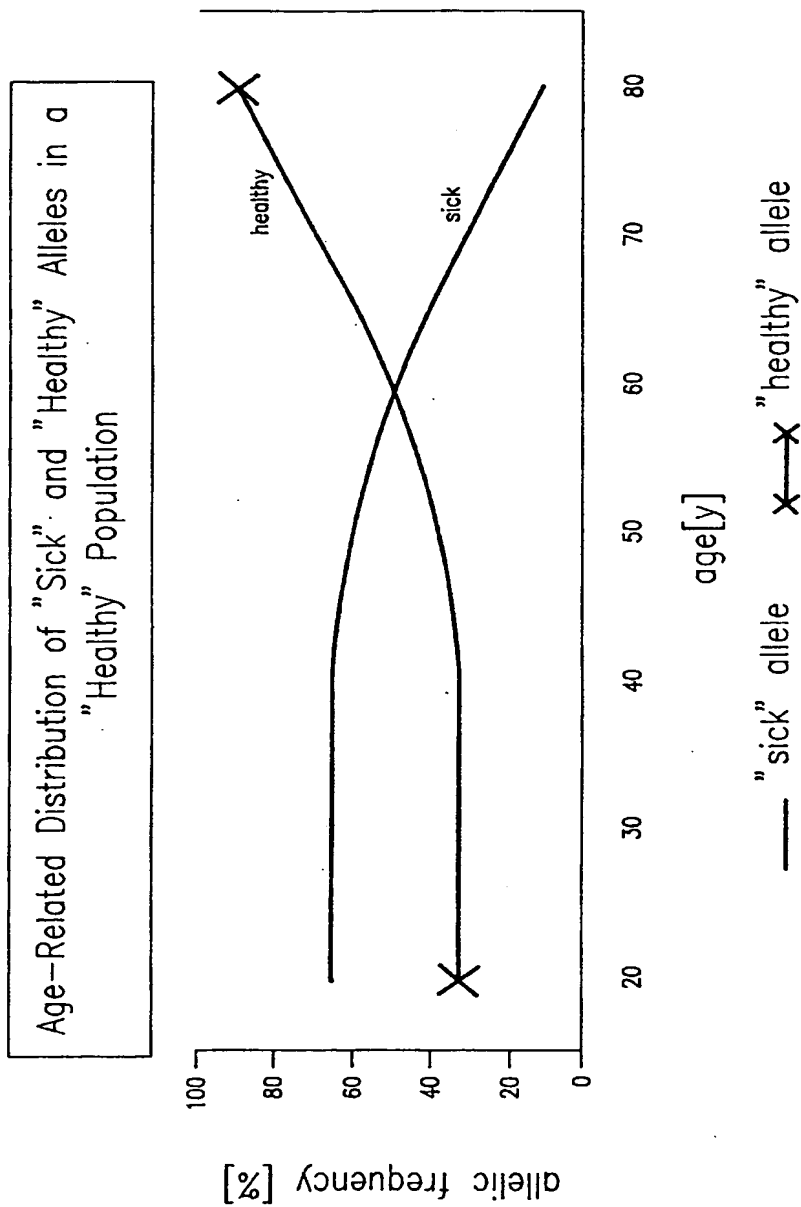


FIG. 5

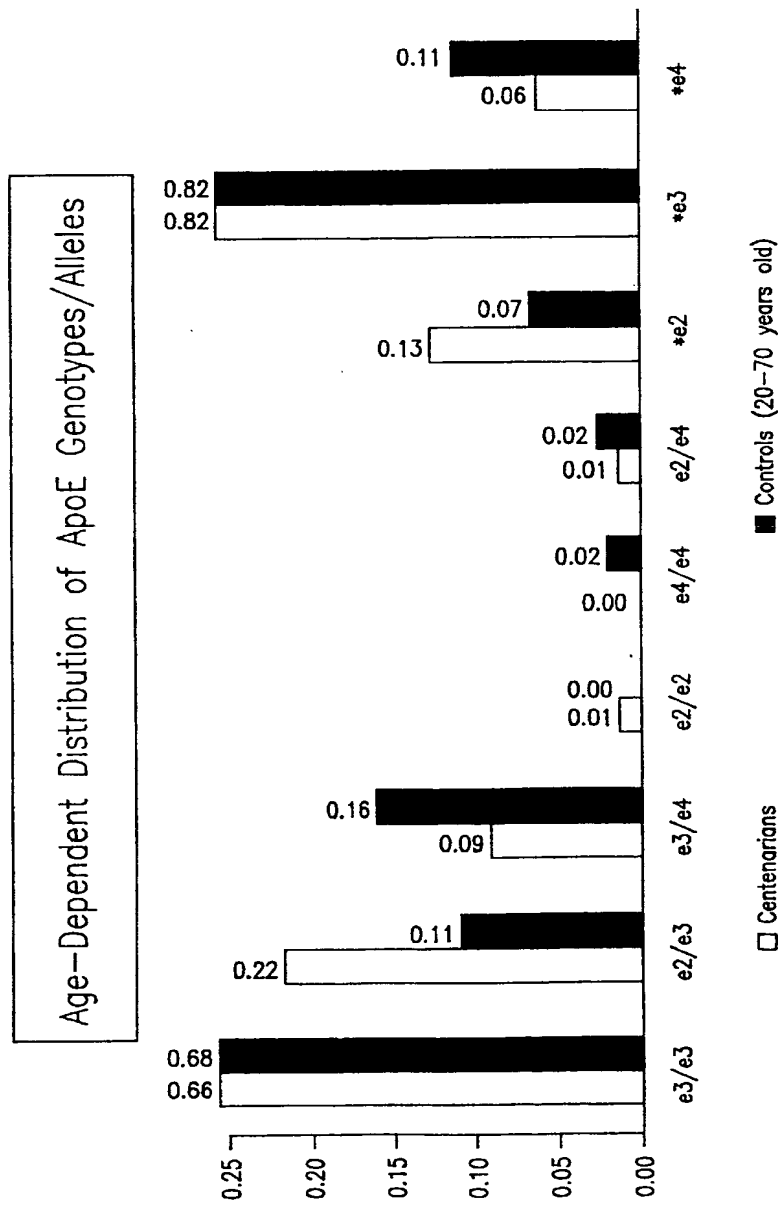


FIG. 6

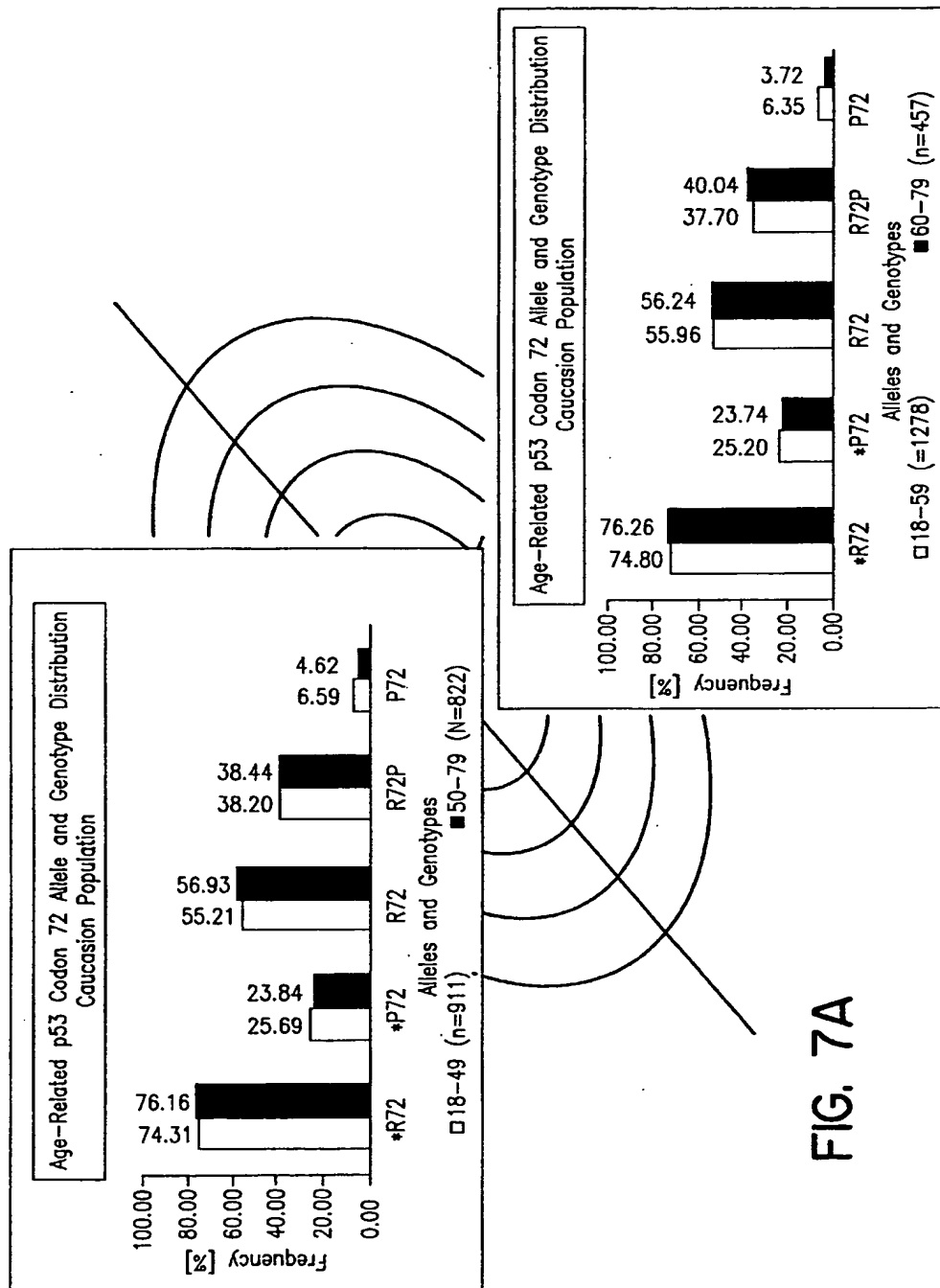


FIG. 7A

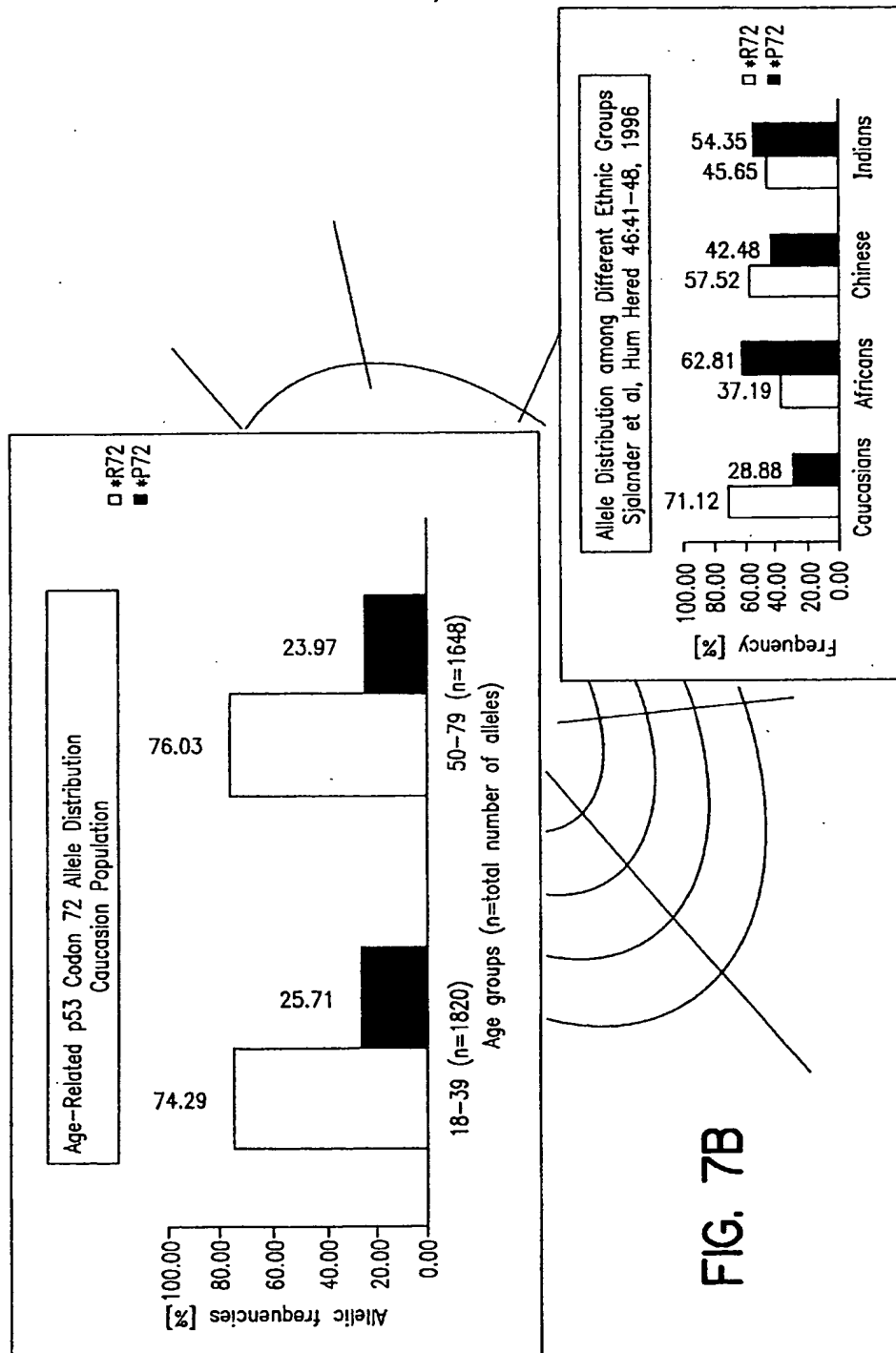
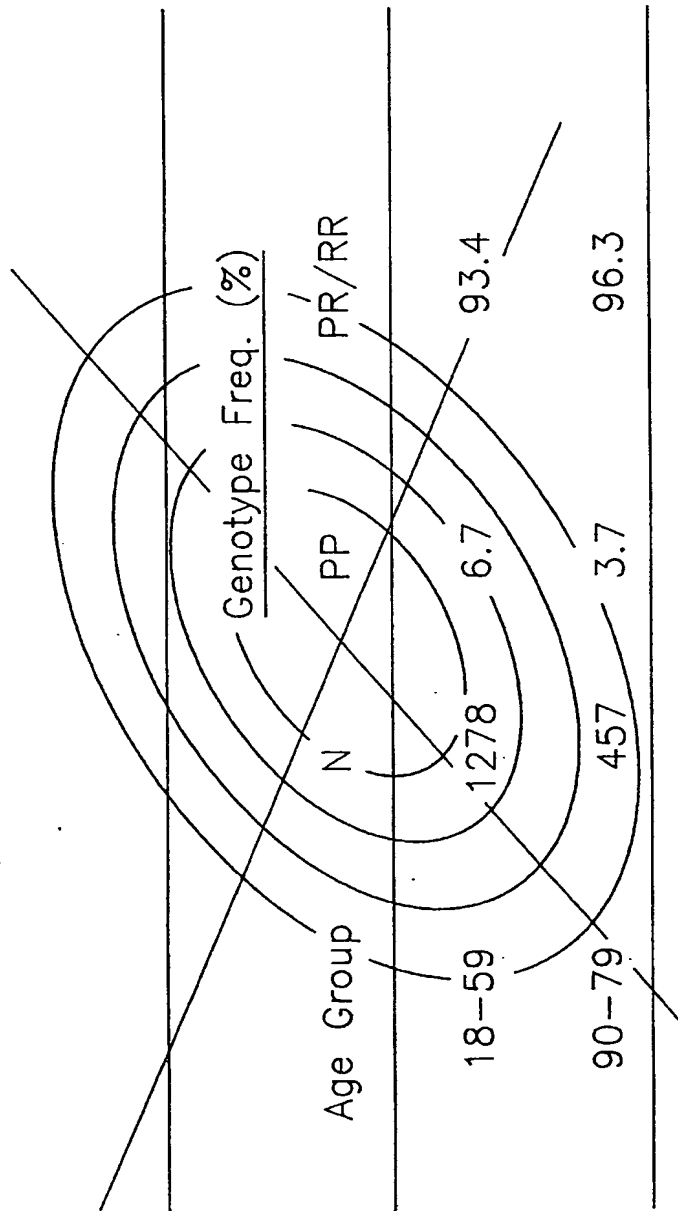


FIG. 7B

12/51

FIG. 7C
P53 PP vs. PR/RR Genotype Distribution
By Age cut point = 59



Genomic Organization of the p53 Gene

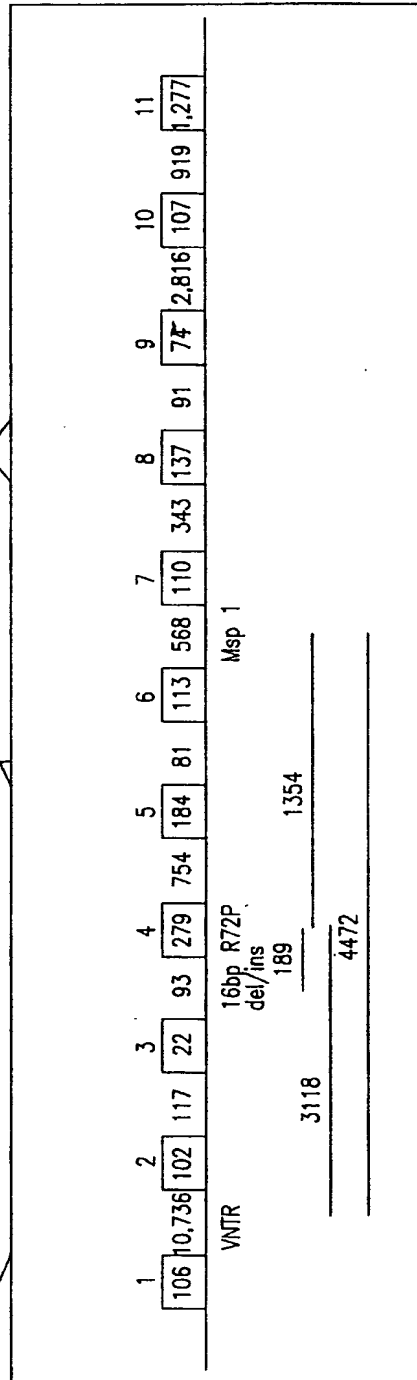


FIG. 7D

14/ 51

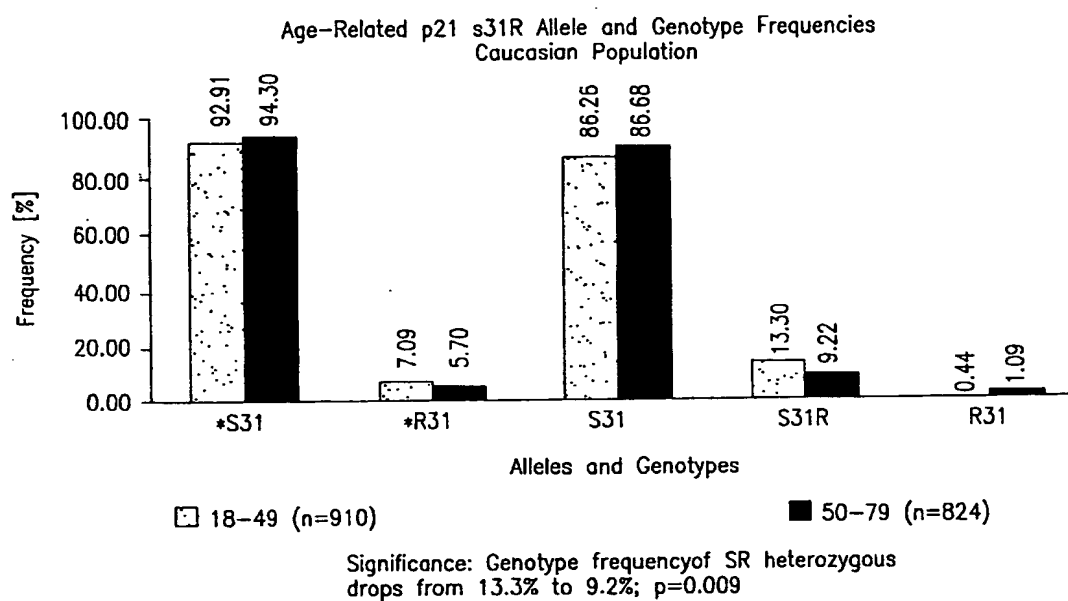


FIG. 8

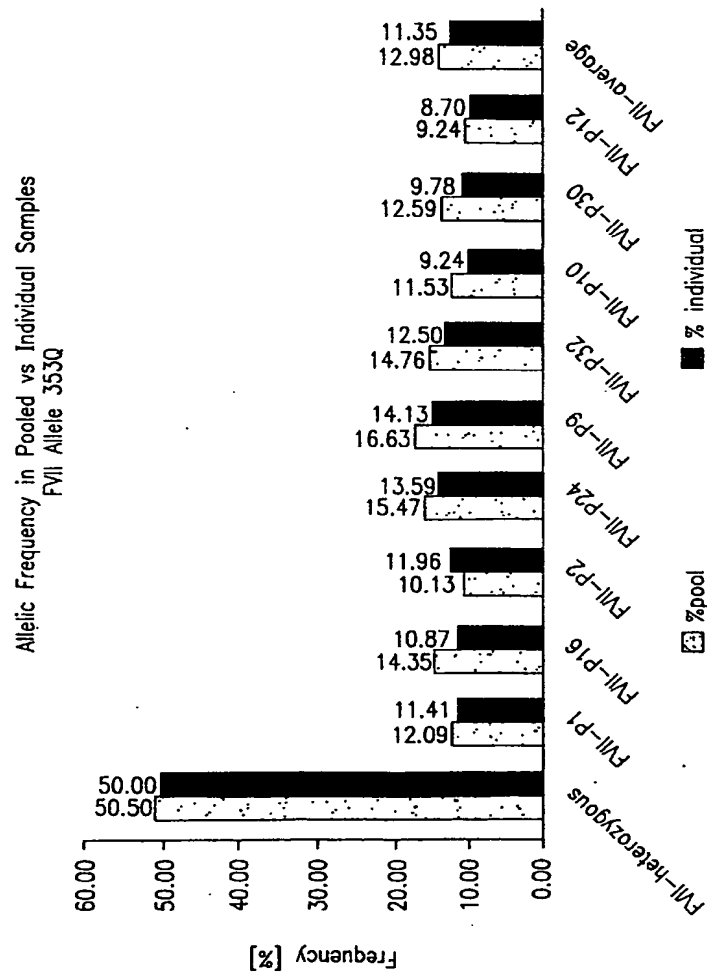


FIG. 9

16 / 51

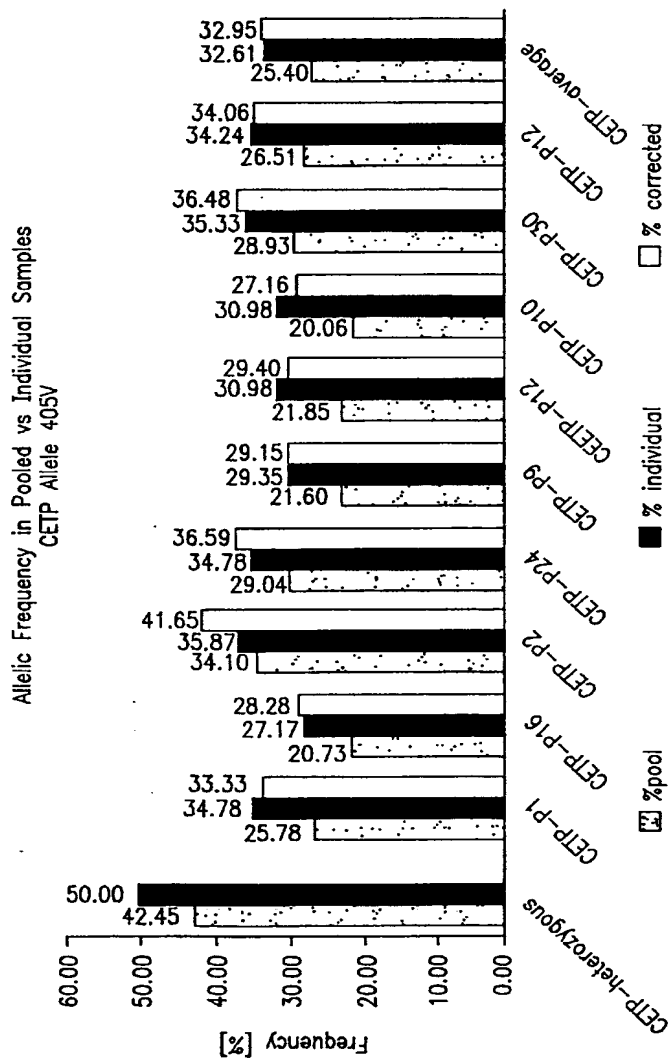


FIG. 10

17/51

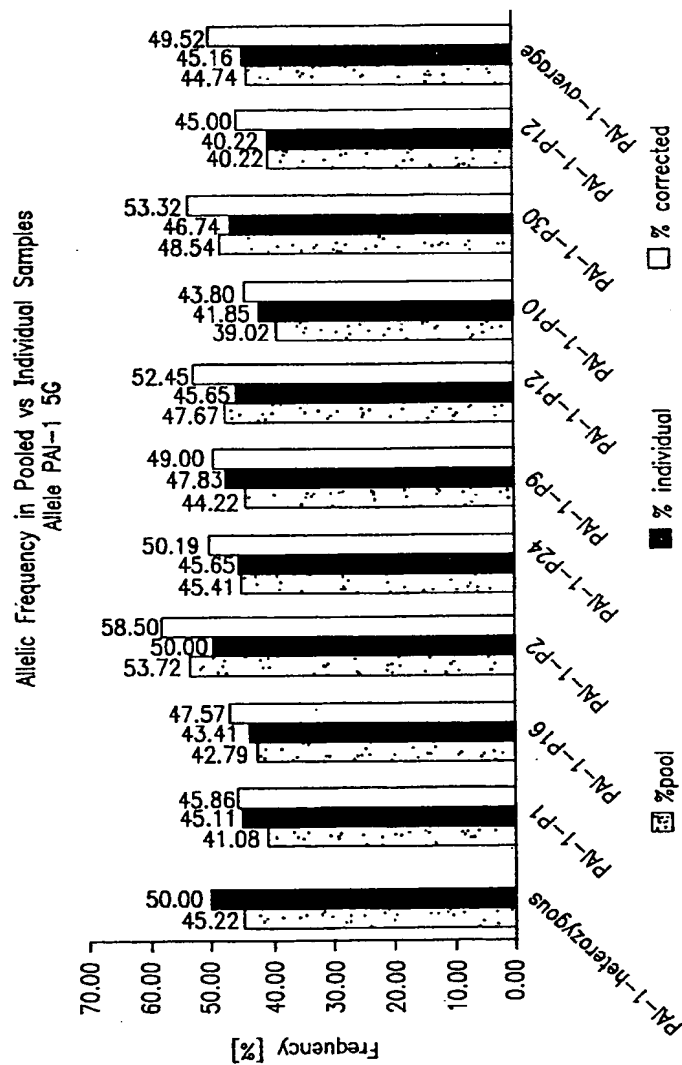


FIG. 11

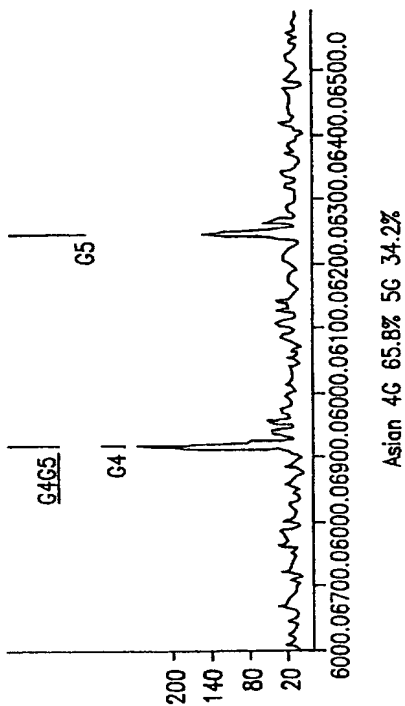


FIG. 12A

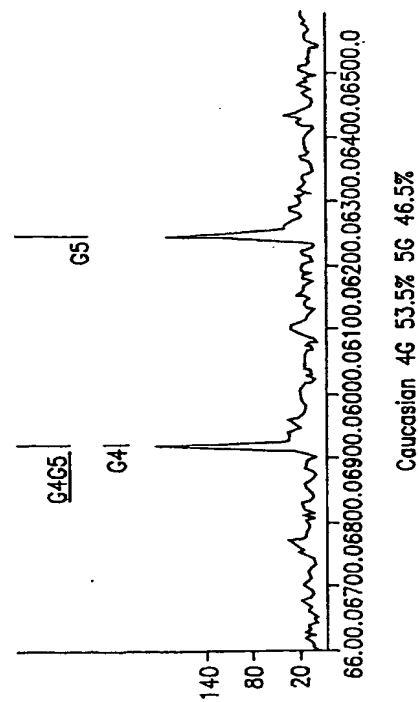


FIG. 12C

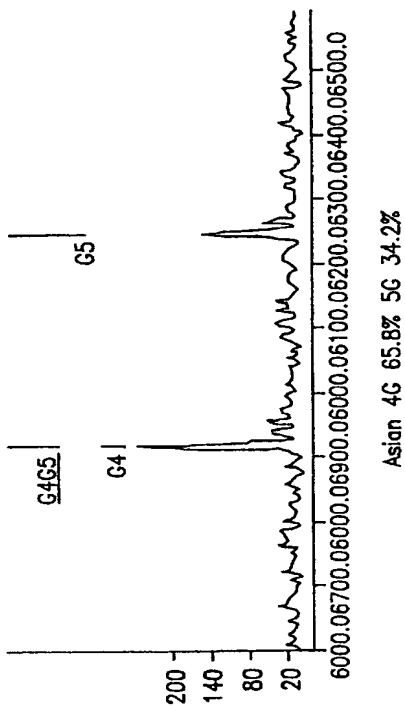


FIG. 12B

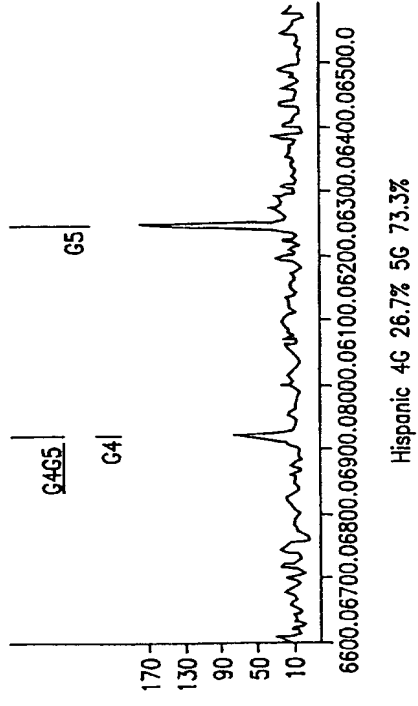
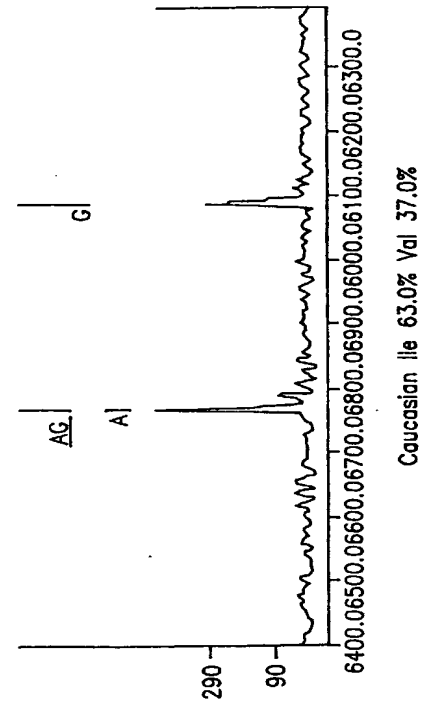
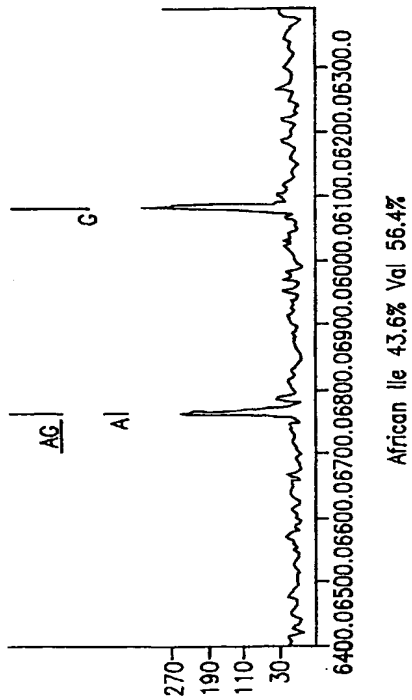
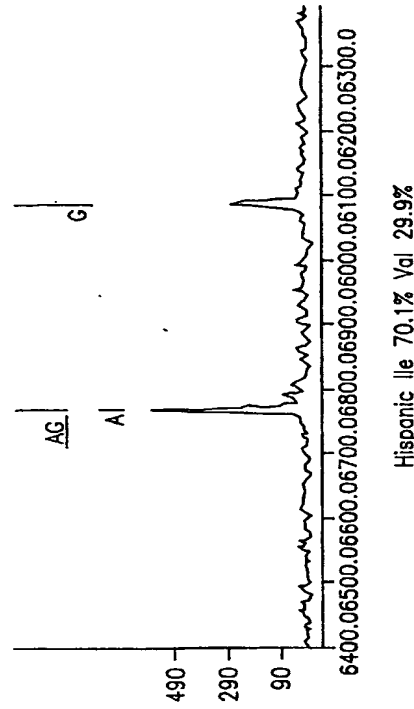
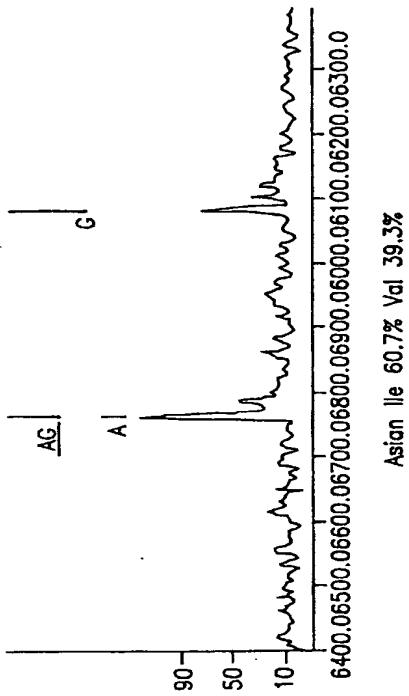


FIG. 12D

19/51



20/51

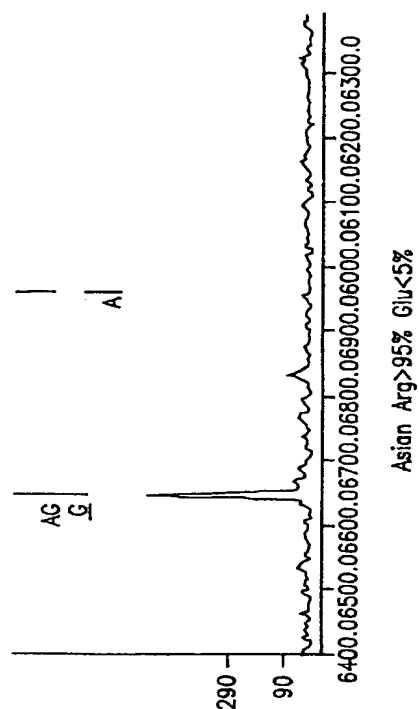


FIG. 14B

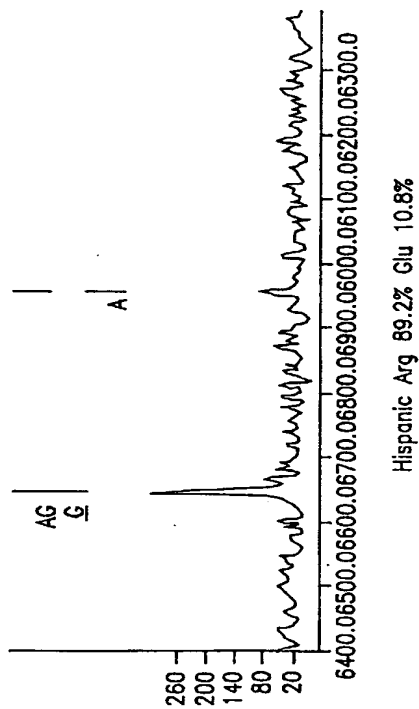


FIG. 14D

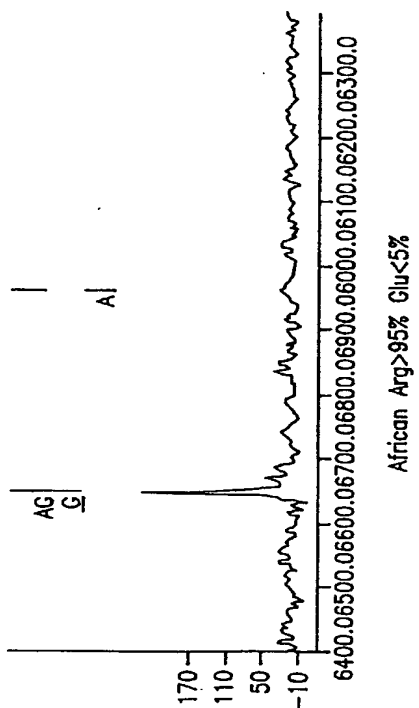


FIG. 14A

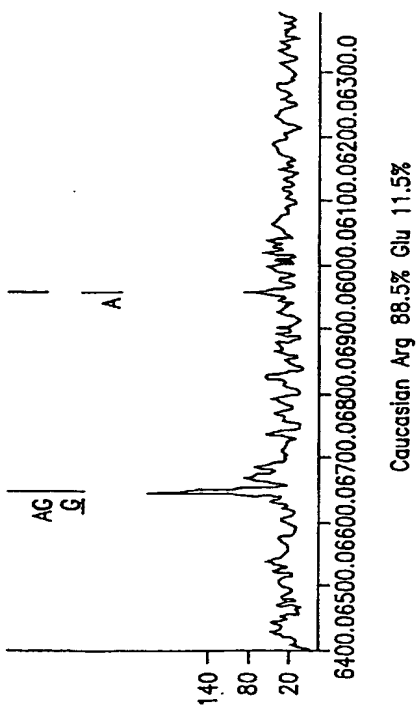


FIG. 14C

21/51

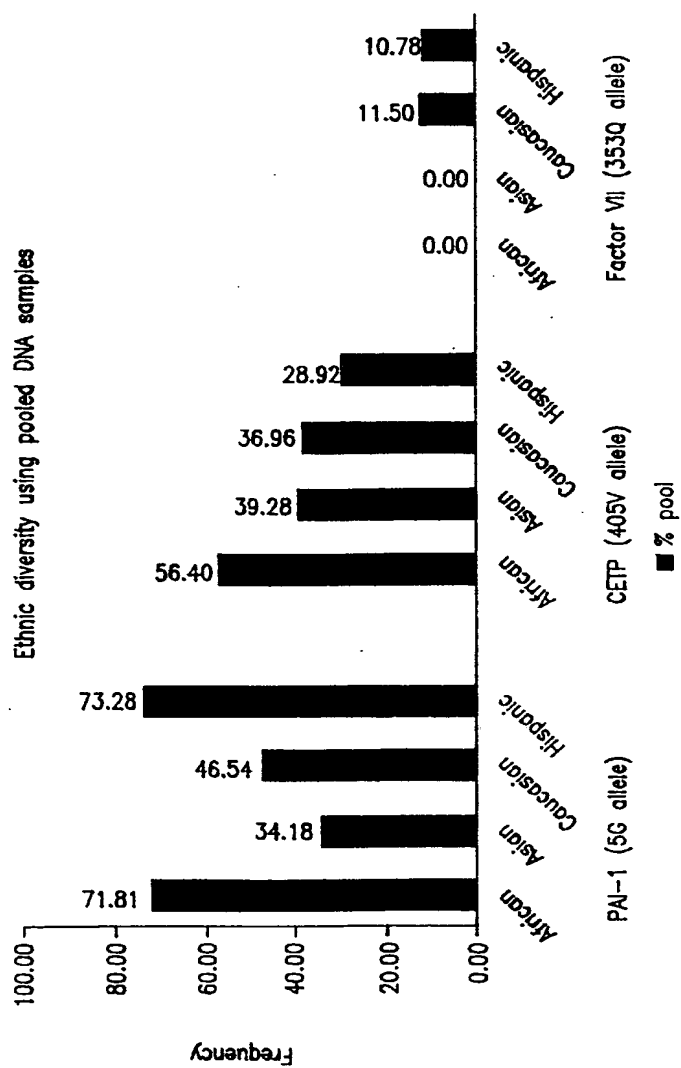


FIG. 15

22/ 51

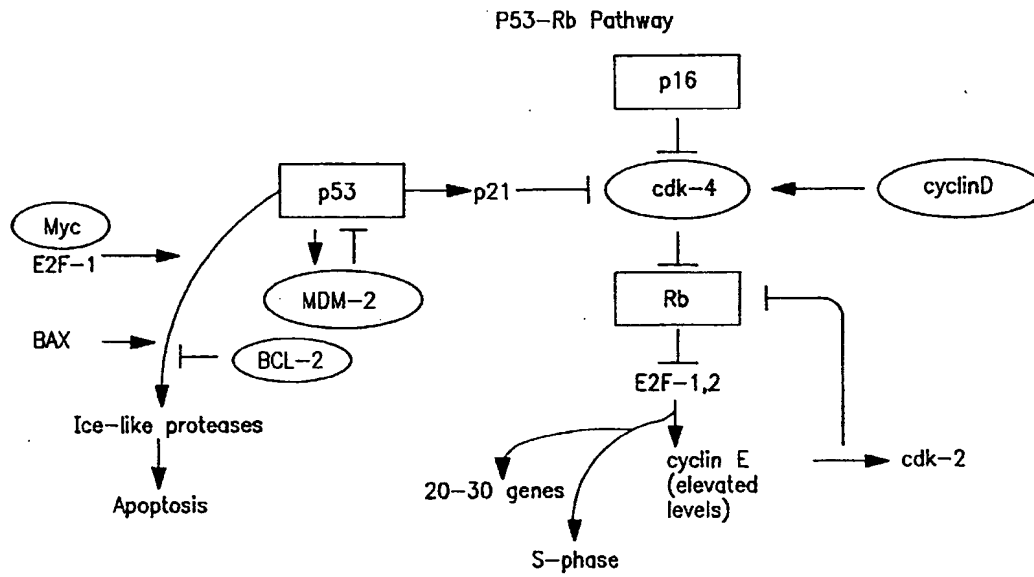


FIG. 16

23/51

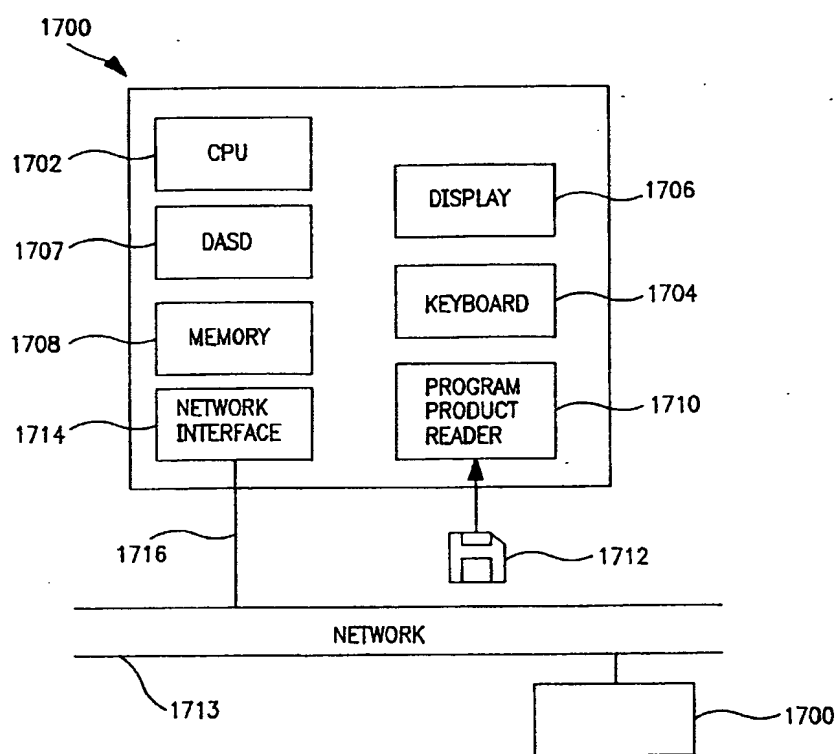


FIG. 17

24/51

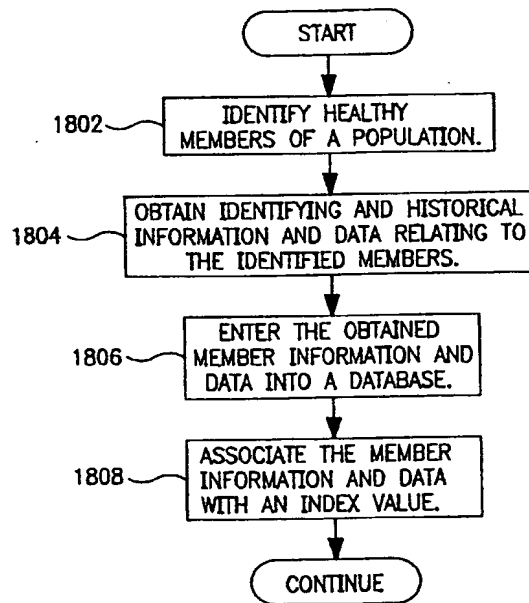


FIG. 18

25/51

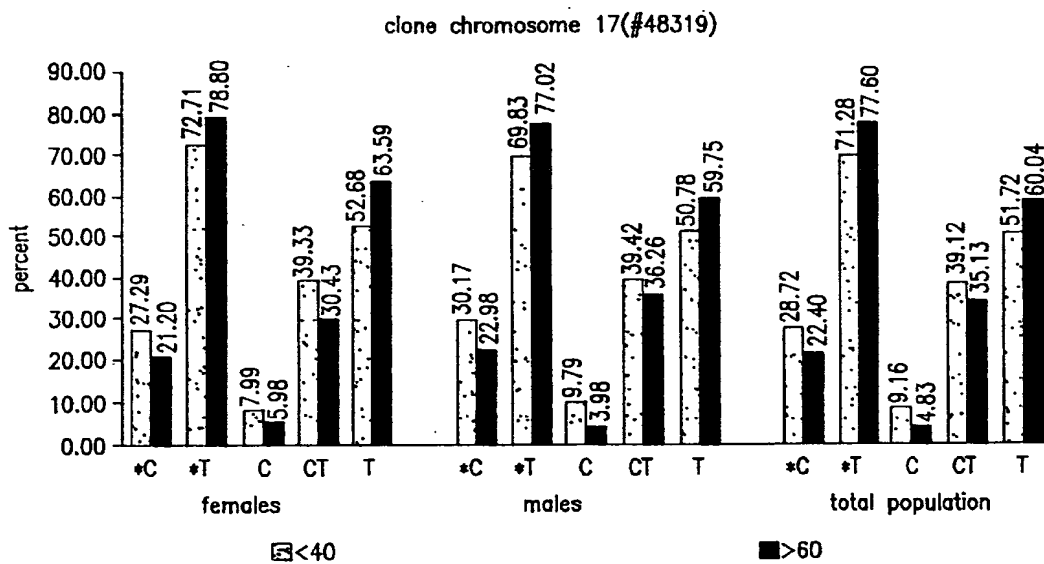


FIG. 19

26/51

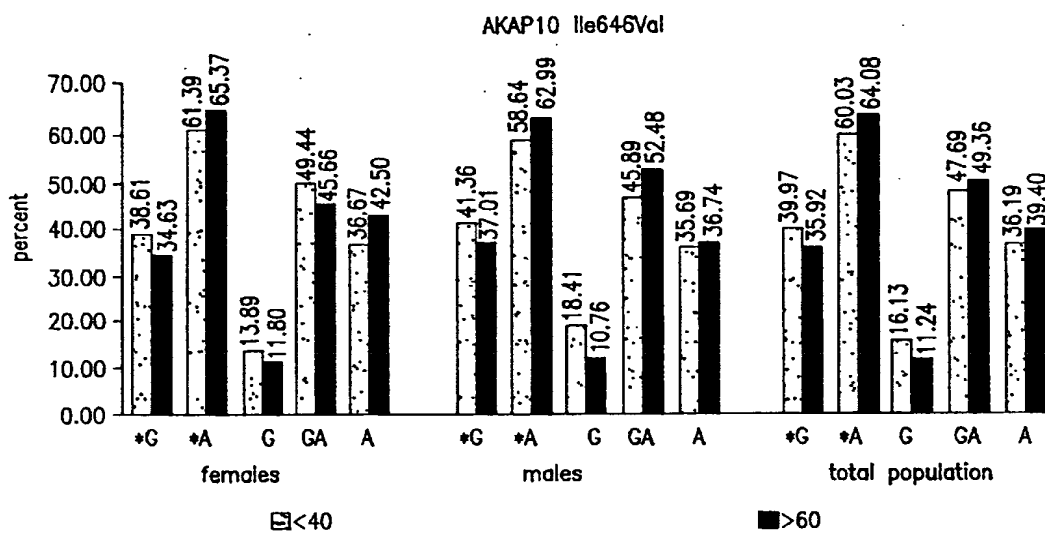


FIG. 20

27/51

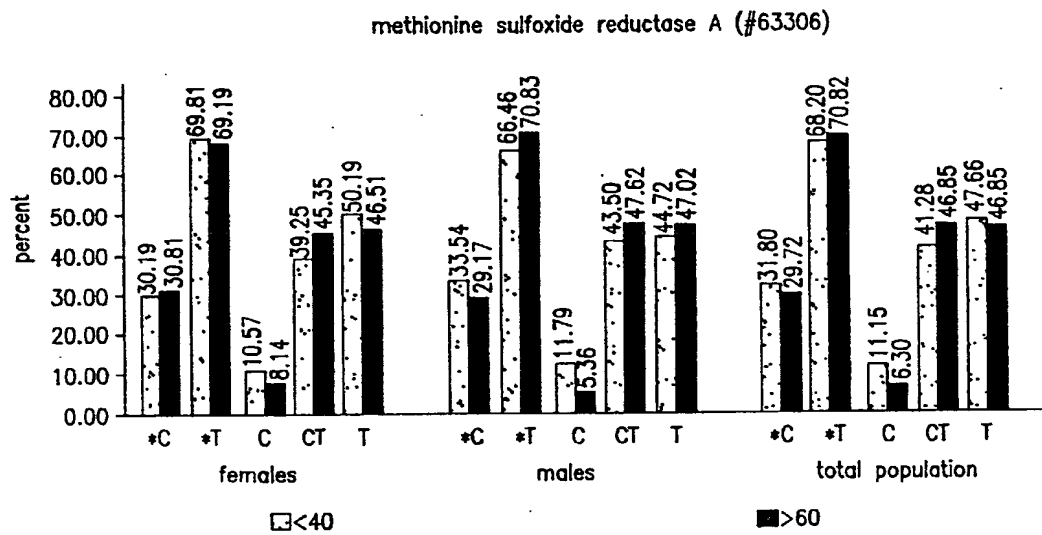


FIG. 21

Collection Information

Consent Form Signed
☐ Yes ☐ No

Date of Collection
Month: ☐ JAN ☐ FEB ☐ MAR ☐ APR ☐ MAY ☐ JUN ☐ JUL ☐ AUG ☐ SEP ☐ OCT ☐ NOV ☐ DEC
Day: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31
Year: ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31

Time of Sample Collection (nearest hour, in 24 hour clock format)
☐ 00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23

Initials
☐ 00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23

Initials of Data Collector
☐ 00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23

(DO NOT COMPLETE; for data entry only)

Sample;
☐ Intact
☐ Lost
☐ Broken

Volume (ml)
☐ 00 ☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05 ☐ 06 ☐ 07 ☐ 08 ☐ 09 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23

BAR CODE

Donor Information

Date of Birth
Month: ☐ JAN ☐ FEB ☐ MAR ☐ APR ☐ MAY ☐ JUN ☐ JUL ☐ AUG ☐ SEP ☐ OCT ☐ NOV ☐ DEC
Day: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31
Year: ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31

Sex:
☐ Male
☐ Female

Height
Ft: ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9
Inches: ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Weight (lb)
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

What Physical activity do you do on a regular basis?
☐ Running
☐ Swimming
☐ Biking
☐ Gymnastics
☐ Other
☐ None

Are you a vegetarian?
☐ Yes
☐ No

If Female:
How many times have you been pregnant?
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9
How many times did you give birth?
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

To the best of your knowledge, what is the Ethnic Origin of your:

Father: ☐ Caucasian (please mark specific geographic area below if known)
☐ Northern Europe (Austria, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland, UK)
☐ Southern Europe (Greece, Italy, Spain, Turkey)
☐ Eastern Europe (Czechoslovakia, Hungary, Poland, Russia, Yugoslavia)
☐ Middle Eastern (Israel, Egypt, Iran, Iraq, Jordan, Syria, Other Arab States)
☐ African-American
☐ Hispanic (please mark specific geographic area below if known)
☐ Mexico
☐ Central America, South America
☐ Cuba, Puerto Rico, other Caribbean
☐ Asian (please mark specific geographic area below if known)
☐ Japanese
☐ Chinese
☐ Korean
☐ Vietnamese
☐ Filipino
☐ Native American
☐ Other
☐ Don't know

Mother: ☐ Caucasian (please mark specific geographic area below if known)
☐ Northern Europe (Austria, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland, UK)
☐ Southern Europe (Greece, Italy, Spain, Turkey)
☐ Eastern Europe (Czechoslovakia, Hungary, Poland, Russia, Yugoslavia)
☐ Middle Eastern (Israel, Egypt, Iran, Iraq, Jordan, Syria, Other Arab States)
☐ African-American
☐ Hispanic (please mark specific geographic area below if known)
☐ Mexico
☐ Central America, South America
☐ Cuba, Puerto Rico, other Caribbean
☐ Asian (please mark specific geographic area below if known)
☐ Japanese
☐ Chinese
☐ Korean
☐ Vietnamese
☐ Filipino
☐ Native American
☐ Other
☐ Don't know

How long have you lived there?
Years: ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

What is your highest grade you completed in school?
☐ less than 8th grade
☐ 8th, 9th, 10th, or 11th grade
☐ high school graduate or equivalency
☐ some college, 2yr degree
☐ college graduate, 4yr degree
☐ post graduate education or degree

Mother Deceased? Cause of Death Mother: ☐ Yes ☐ No
If Yes at what age?
☐ < 29
☐ 30-39
☐ 40-49
☐ 50-59
☐ 60-69
☐ 70-79
☐ 80-89
☐ ≥ 90

Father Deceased? Cause of Death Father: ☐ Yes ☐ No
If Yes at what age?
☐ < 29
☐ 30-39
☐ 40-49
☐ 50-59
☐ 60-69
☐ 70-79
☐ 80-89
☐ > 90

FIG 22A

FIG. 22A

29/ 51

Have you ever smoked? ☐ Yes ☐ No

If yes, for how long?

00	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00

 Years

Have you been hospitalized in the past 5 years for more than 6 days at a time? ☐ Yes ☐ No

If yes, how many times?

00	00	00	00	00	00	00	00	00	00
----	----	----	----	----	----	----	----	----	----

For each hospitalization (if not the same) how long did you stay and for what reason?

1) Weeks:

00	00	00	00	00	00
----	----	----	----	----	----

☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____

2) Weeks:

00	00	00	00	00	00
----	----	----	----	----	----

☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____

3) Weeks:

00	00	00	00	00	00
----	----	----	----	----	----

☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____

Have you or has anyone in your immediate family (parents, brothers, sisters, or your children) had the following?
Mark all that apply!

Disease	You	Mother	Father	Sister	Brother	Child
Heart Disease, including arteriosclerosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blood clots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, insulin dependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, not insulin-dependent (diet controlled)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lung & Bronchus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breasts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prostate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colon & Rectum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lymphoma & Leukemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alzheimer's Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Epilepsy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schizophrenia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bipolar disorder (manic depression)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Major depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic Inflammatory or Autoimmune Disease including Multiple Sclerosis and Rheumatoid Arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emphysema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you take prescription drugs on a regular basis? ☐ Yes ☐ No

If yes, please specify below:

Have you ever donated blood before? ☐ Yes ☐ No

If yes, how many times: Number of Times

00	00	00	00	00	00	00	00	00	00
----	----	----	----	----	----	----	----	----	----

Additional health information details you would like to provide:

Do you drink any kind of alcoholic beverage?

☐ Never ☐ Hardly ever
☐ Less than 3 times per week ☐ 3 or more times per week
☐ Daily

FOR
OFFICE
USE ONLY

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

FIG. 22B

SUBSTITUTE SHEET (RULE 26)

30/51

FIG. 22C

SUBSTITUTE SHEET (RULE 26)

31/51

What is your highest grade you completed in school?

☐ less than 8th grade ☐ Yes ☐ No

☐ 8th, 9th, 10th, or 11th grade ☐ No

☐ high school graduate or equivalency

☐ some college, 2yr degree

☐ college graduate, 4yr degree

☐ post graduate education or degree

Mother Deceased? Cause of Death Mother: Father Deceased? Cause of Death Father:

If Yes at what age?

☐ < 29 ☐ Heart Disease ☐ Yes ☐ < 29 ☐ Heart Disease

☐ 30-39 ☐ Cancer ☐ No ☐ 30-39 ☐ Cancer

☐ 40-49 ☐ Stroke ☐ 40-49 ☐ Stroke

☐ 50-59 ☐ Accident ☐ 50-59 ☐ Accident

☐ 60-69 ☐ Suicide ☐ 60-69 ☐ Suicide

☐ 70-79 ☐ Other, _____ ☐ 70-79 ☐ Other, _____

☐ 80-89 ☐ 80-89

☐ ≥ 90 ☐ ≥ 90

Health Information

Have you or has anyone in your immediate family (parents, brothers, sisters, or your children) had the following?

Mark all that apply:

Disease	You	Mother	Father	Sister	Brother	Child
Heart Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blood clots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, insulin dependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, not insulin-dependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lung & Bronchus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breasts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prostate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colon & Rectum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lymphoma & Leukemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alzheimer's Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Epilepsy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schizophrenia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bipolar disorder (manic depression)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Major depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic Inflammatory or Autoimmune Disease including Multiple Sclerosis and Rheumatoid Arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emphysema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you take prescription drugs on a regular basis?

☐ Yes ☐ NoHave you ever donated blood before? ☐ Yes ☐ No

If yes, please specify below:

If yes, how many times:

Number of Times

Have you been hospitalized in the past 5 years for more than 6 days at a time?

☐ Yes ☐ No

If yes, how many times?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

For each hospitalization (if not the same) how long did you stay and for what reason?

1) Weeks: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____2) Weeks: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____3) Weeks: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10☐ Acute disorder, including infection and thrombosis
☐ Chronic Disorder
☐ Accident
☐ Other: _____

Do you drink any kind of alcoholic beverage?

☐ Never☐ Hardly ever☐ Less than 3 times per week☐ 3 or more times per week☐ Daily

Additional health information details you would like to provide:

FOR OFFICE USE ONLY

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

FIG. 22D

SUBSTITUTE SHEET (RULE 26)

32 / 51

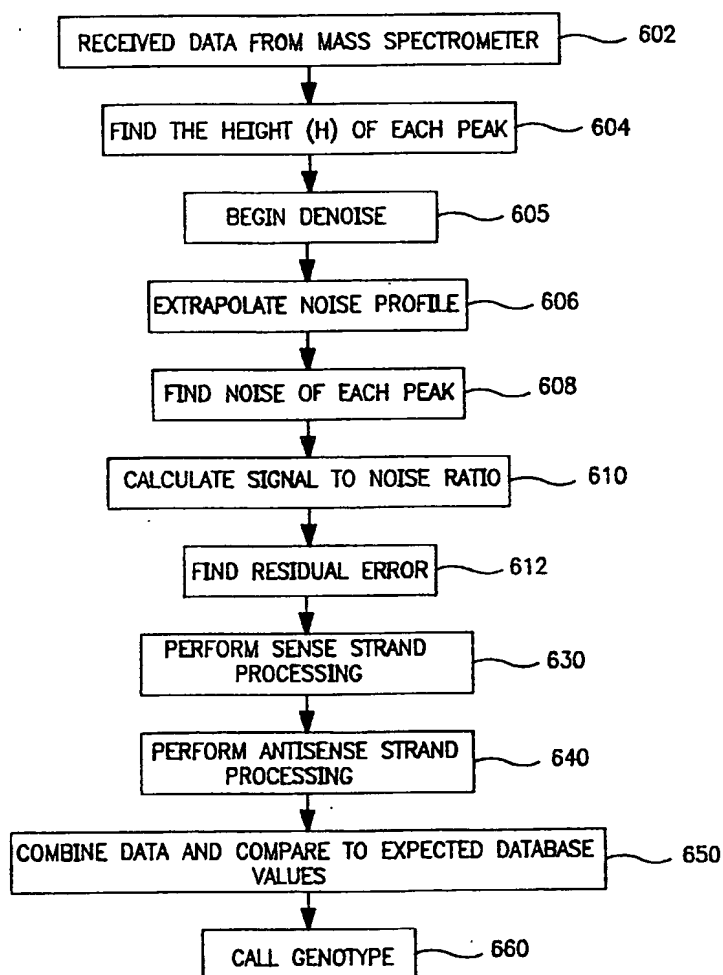


FIG. 23

33/ 51

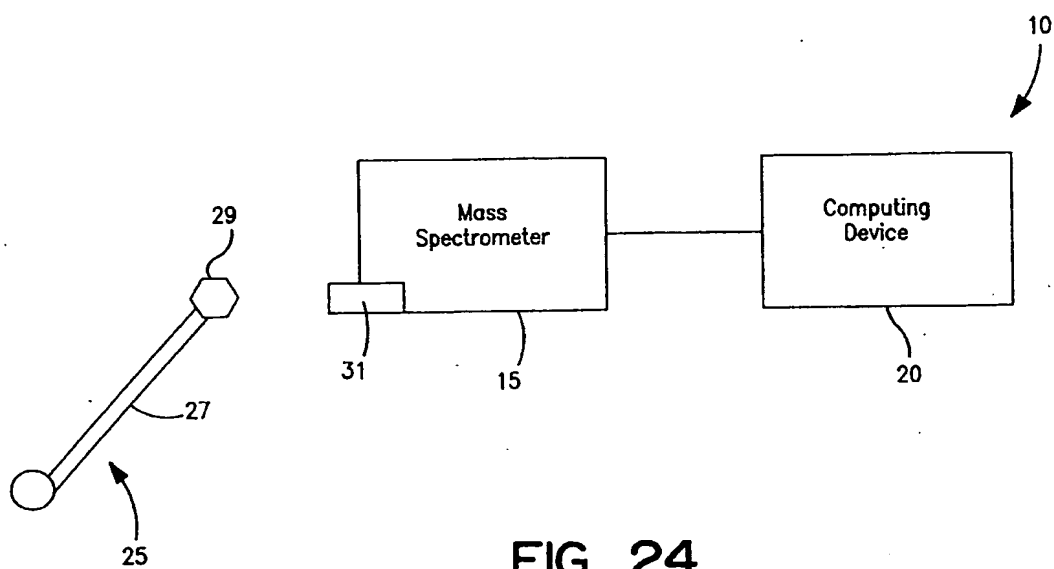


FIG. 24

34 / 51

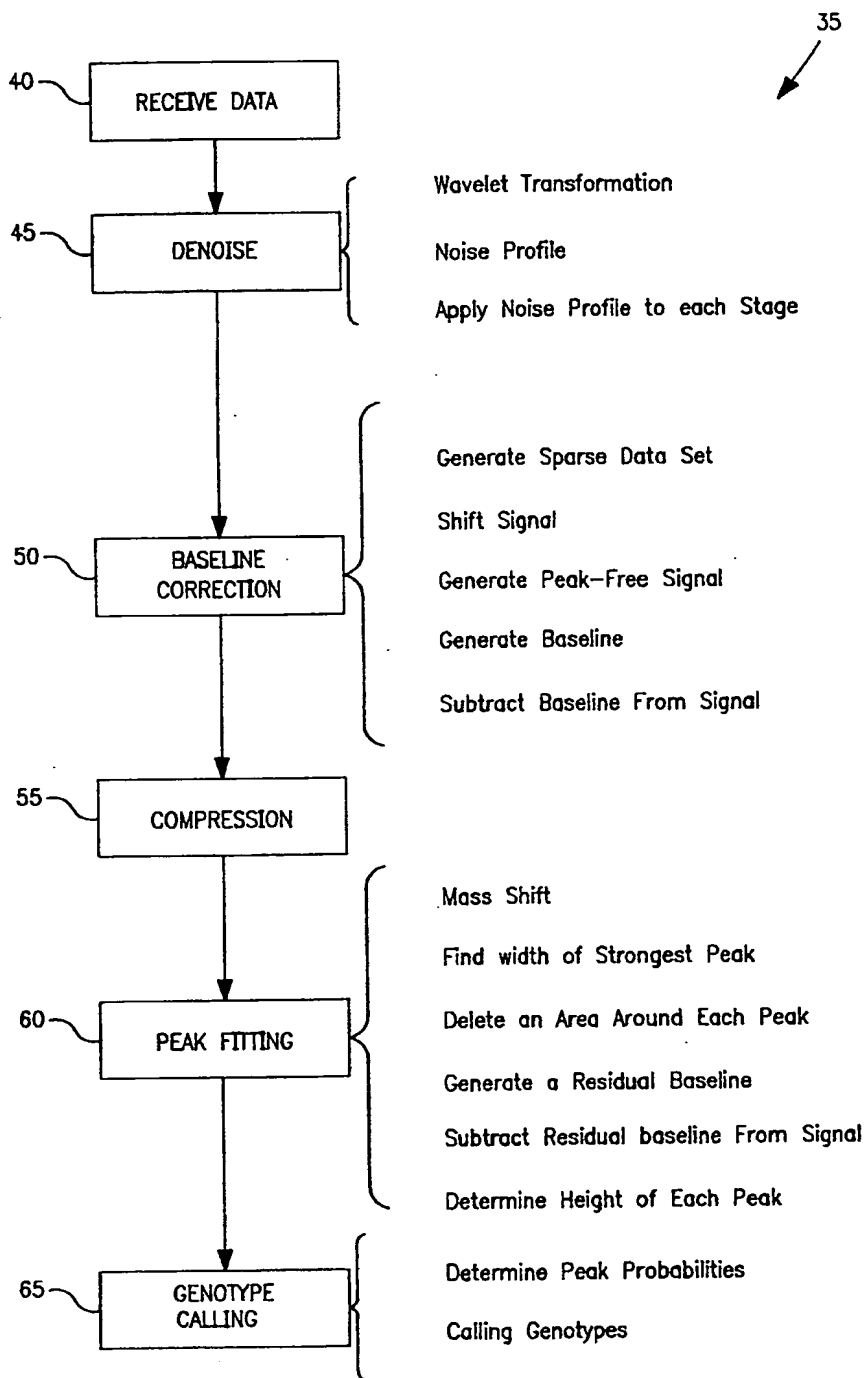


FIG. 25

SUBSTITUTE SHEET (RULE 26)

35/51

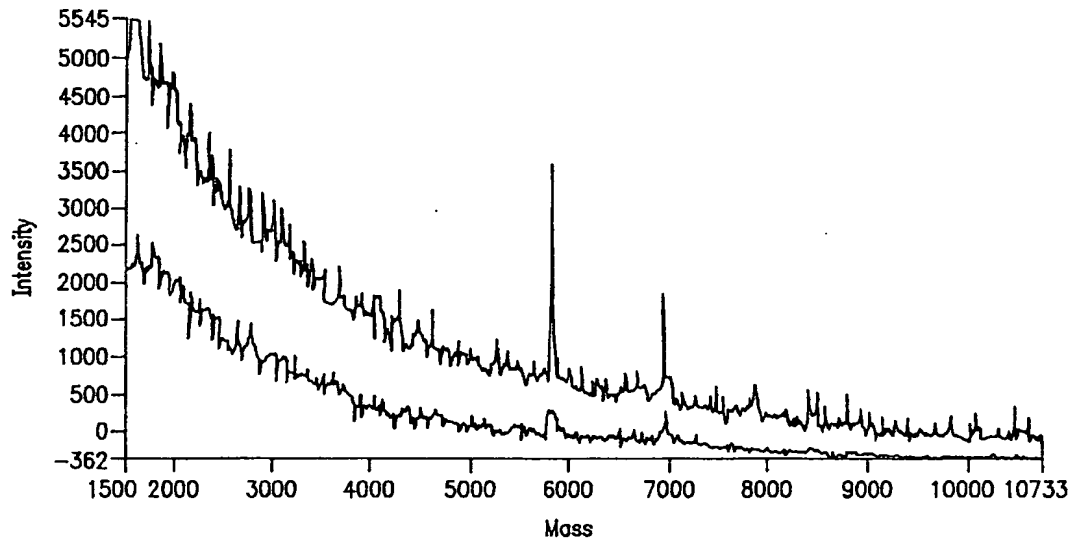


FIG. 26

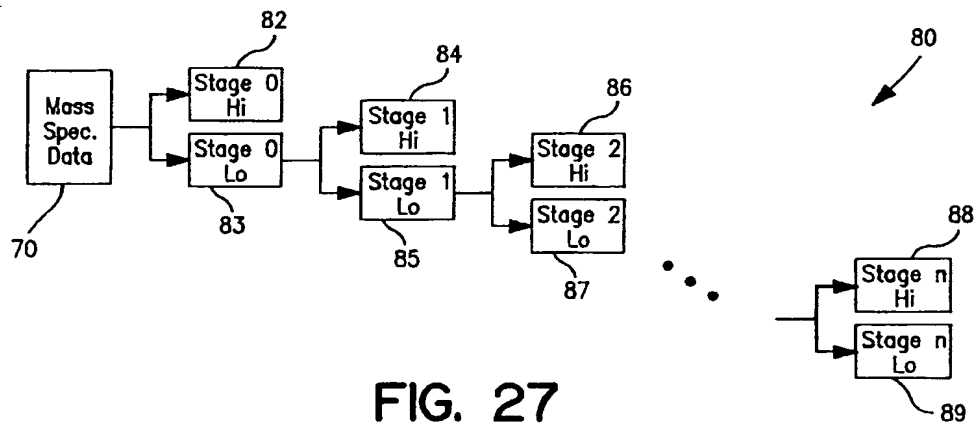


FIG. 27

36/51

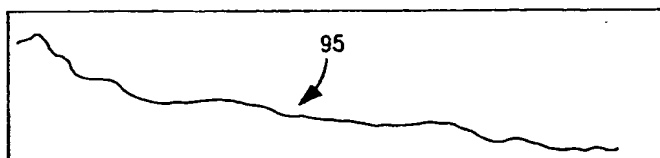


FIG. 28

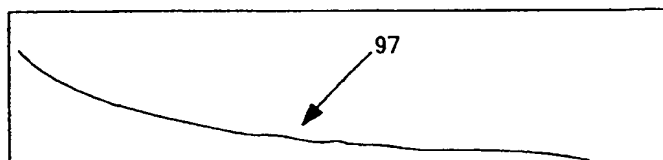


FIG. 29

Exp fitting
 $a_0 + a_1 \exp^{-a_2 m}$

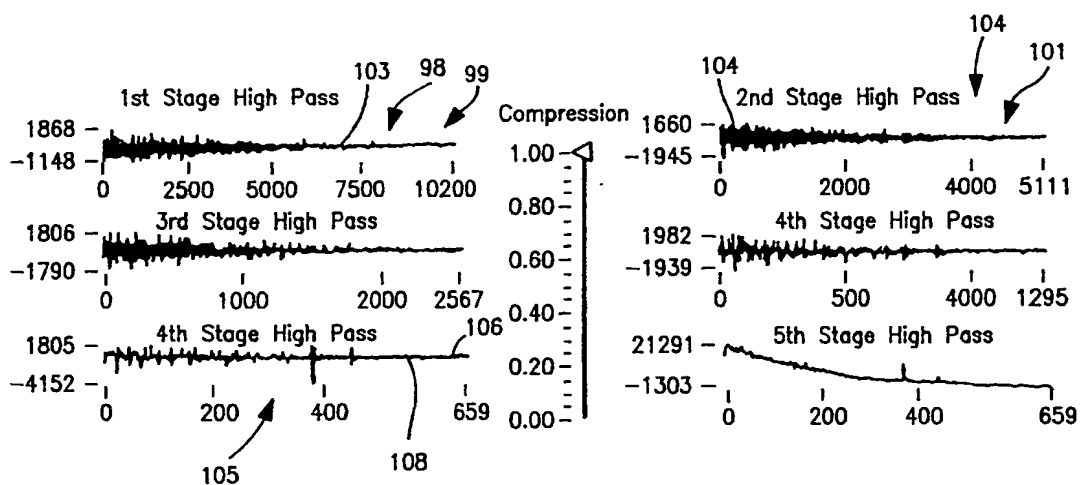


FIG. 30

37/ 51

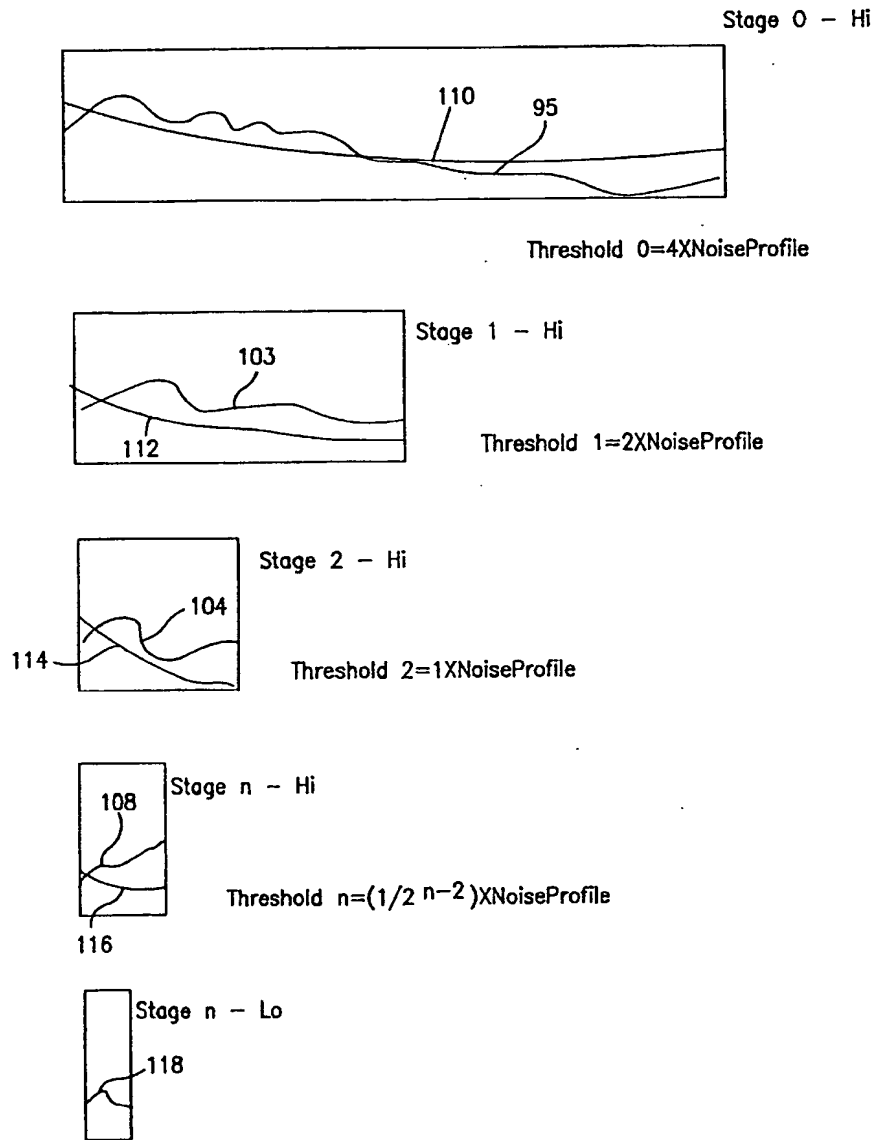


FIG. 3I

38/51

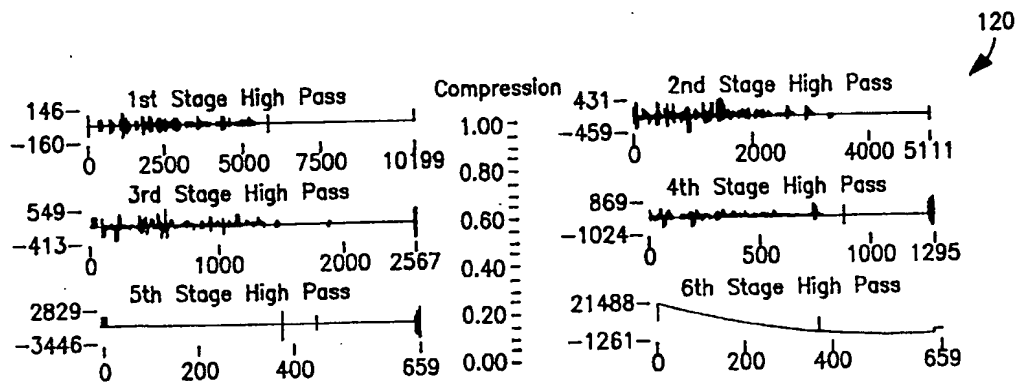


FIG. 32

$$\text{Signal } (t) = \frac{(\text{Start } 0(t) + \text{Start } 1(t) + \text{Start } 2(t) \dots + \text{Start } 23(t))}{24}$$

SHIFT SIGNAL TO ACCOUNT FOR
VARIATIONS DUE TO STARTING POINT

FIG. 33

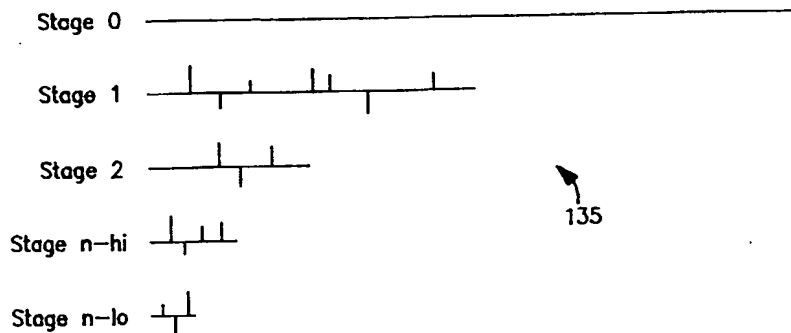


FIG. 34

SUBSTITUTE SHEET (RULE 26)

39/51

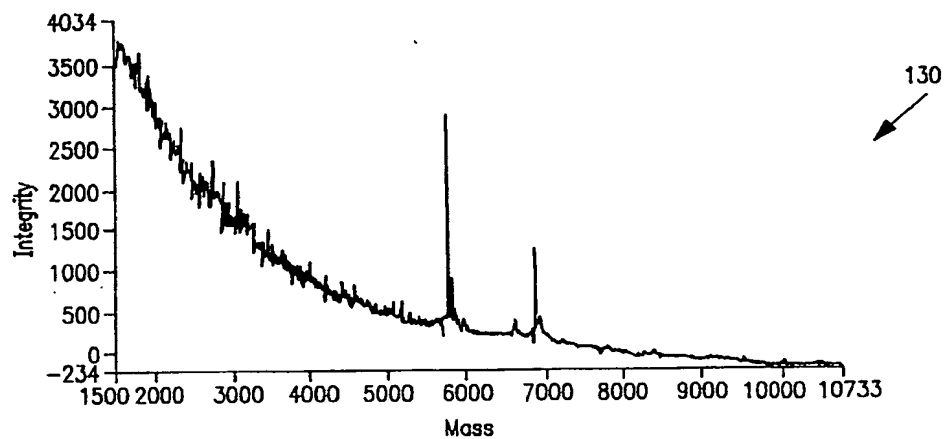


FIG. 35

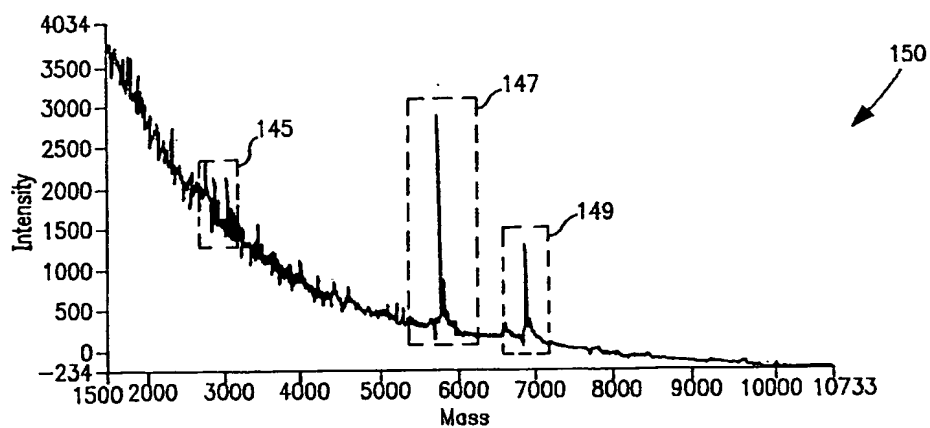


FIG. 13-TAKE A MOVING AVERAGE, REMOVE SECTIONS EXCEEDING A THRESHOLD

FIG. 36

40/51

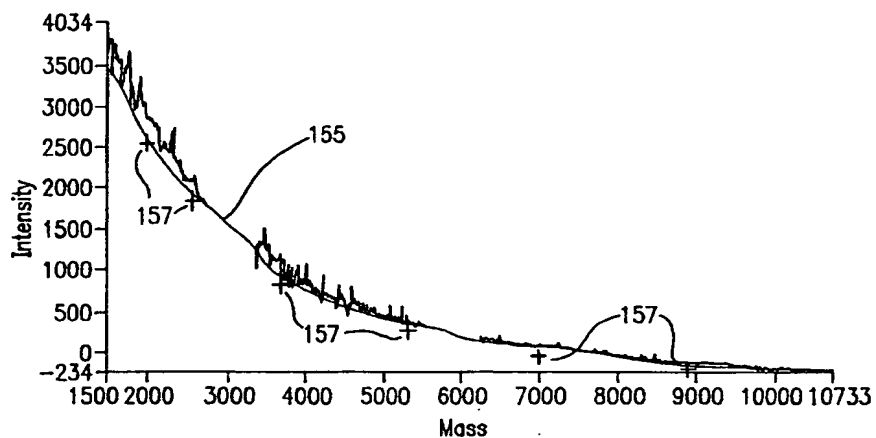


FIG. 37

FIND MINIMA IN REMAINING SIGNALS AND CONNECT TO
FORM A PEAK FREE SIGNAL

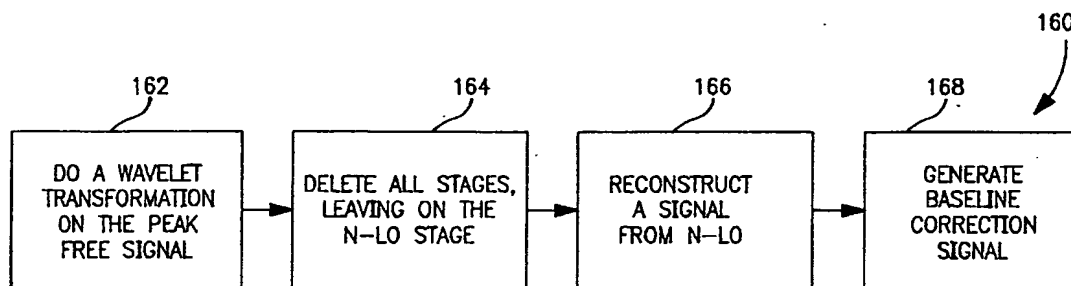


FIG. 38

GENRATE BASLELINE CORRECTION

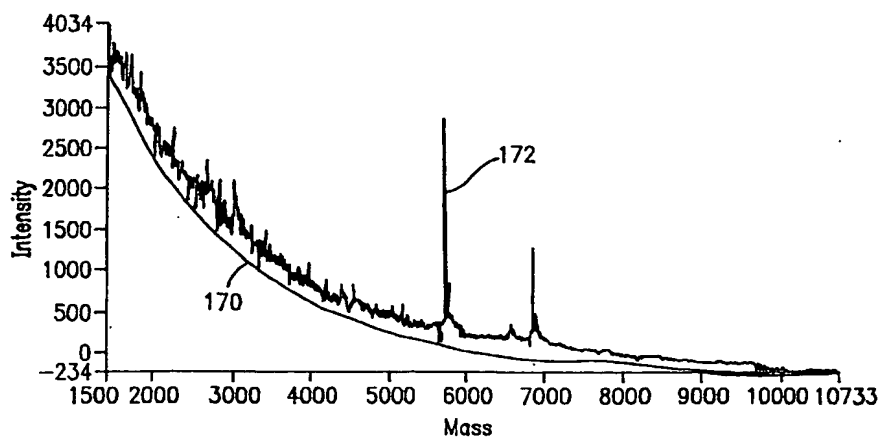


FIG. 39

SUBSTITUTE SHEET (RULE 26)

41/51

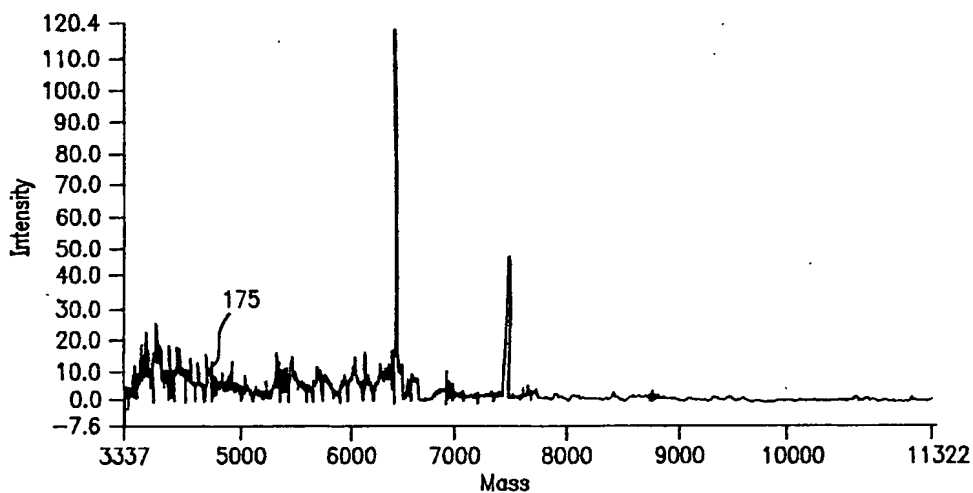


FIG. 40

NON-O COEFFICIENTS	COEFFICIENTS	INTERMEDIATE	RELATIVE
183	25 220 .1 800 890 910 1000 (MAX) 940	100.025 150.220 500.0001 10,050.8 10,075.89 11,125.91 12,100.99999 13,250.94	100.025 50.220 350.0001 9550.8 25.89 150.91 975.99999 1150.94
100 150 500 10,050 10,075 11,125 12,100 13,250			

FIG. 41

42/51

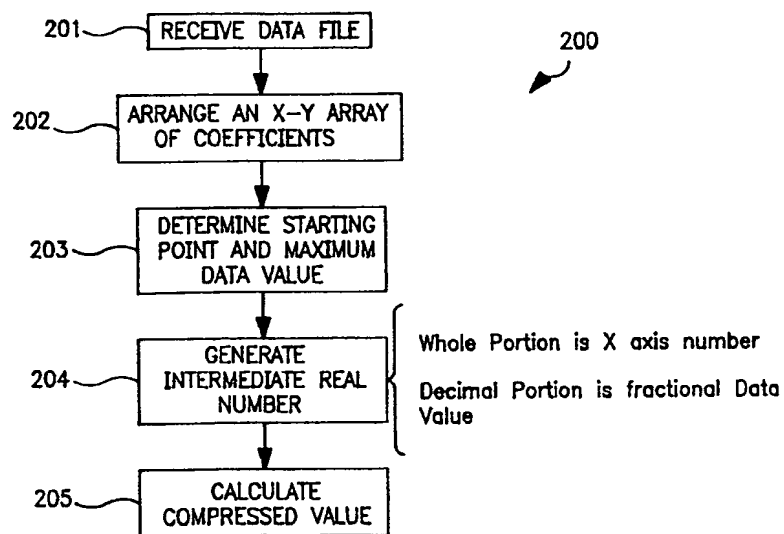


FIG. 42

43/51

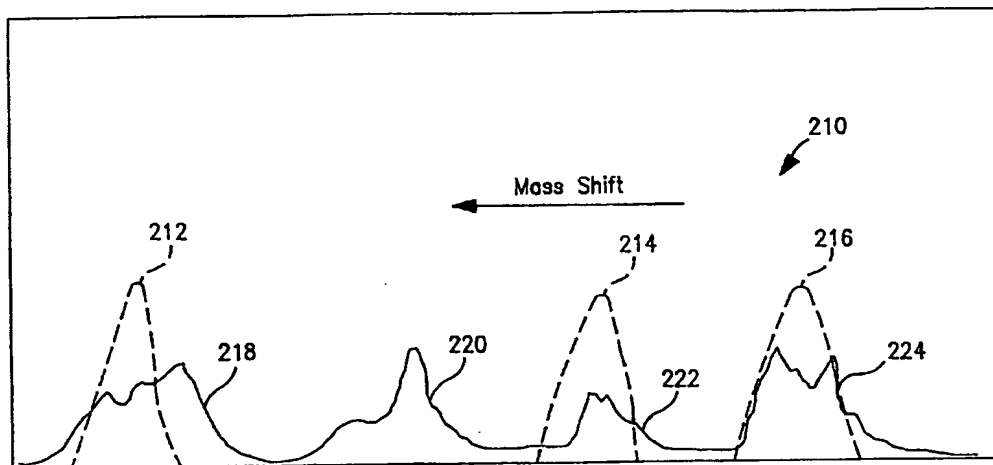


FIG. 43

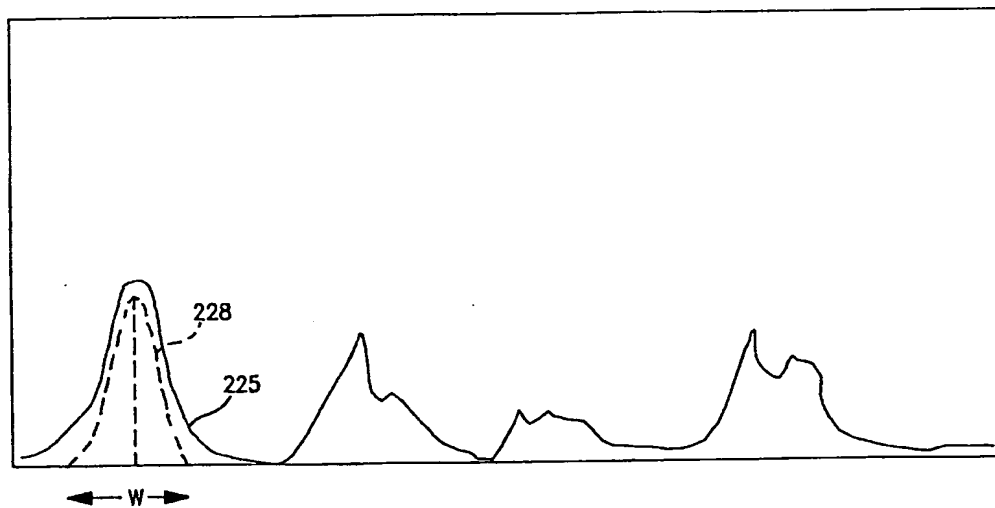


FIG. 44

44/51

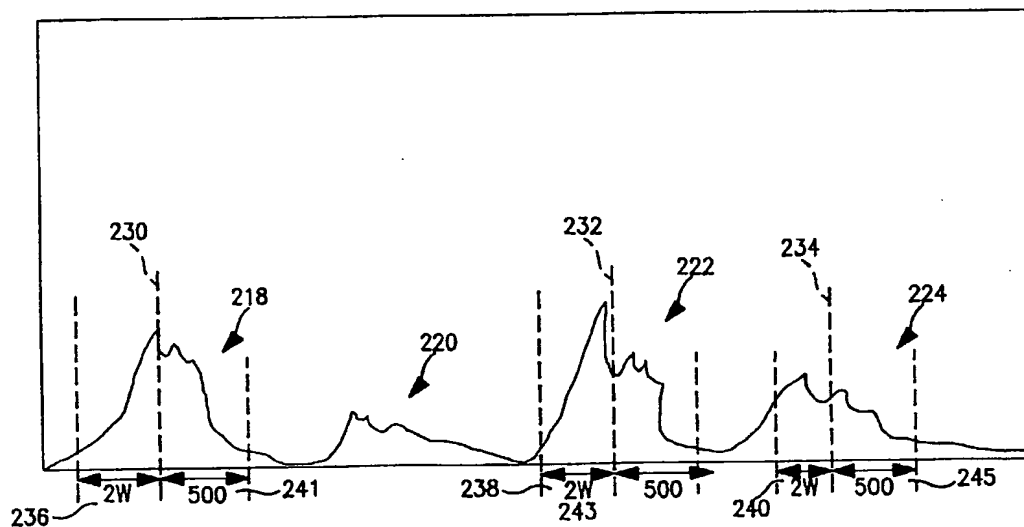


FIG. 45

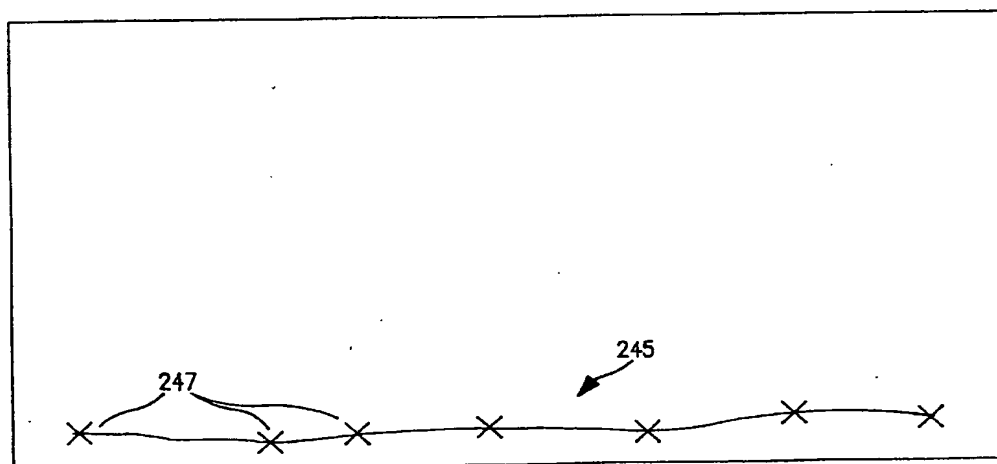


FIG. 46

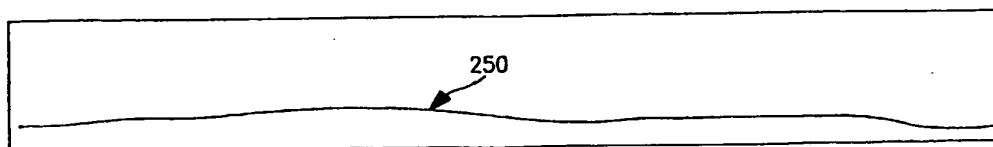


FIG. 47

45/51

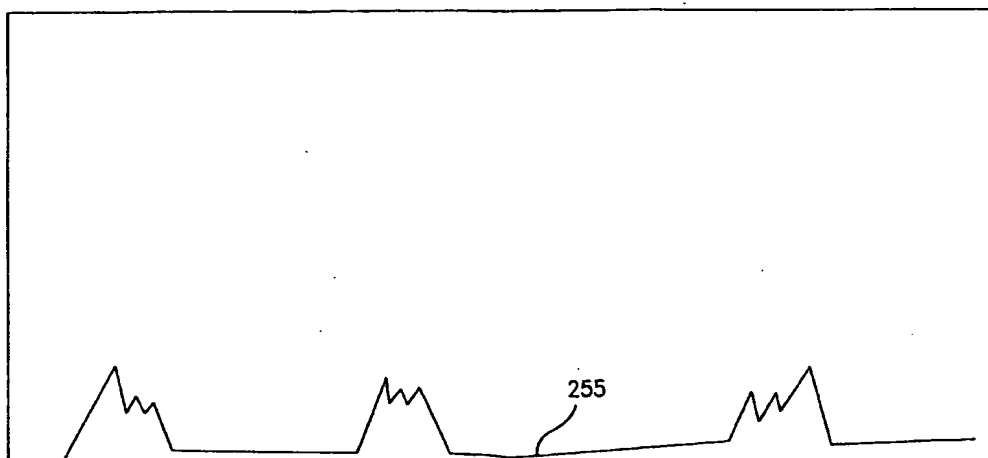


FIG. 48

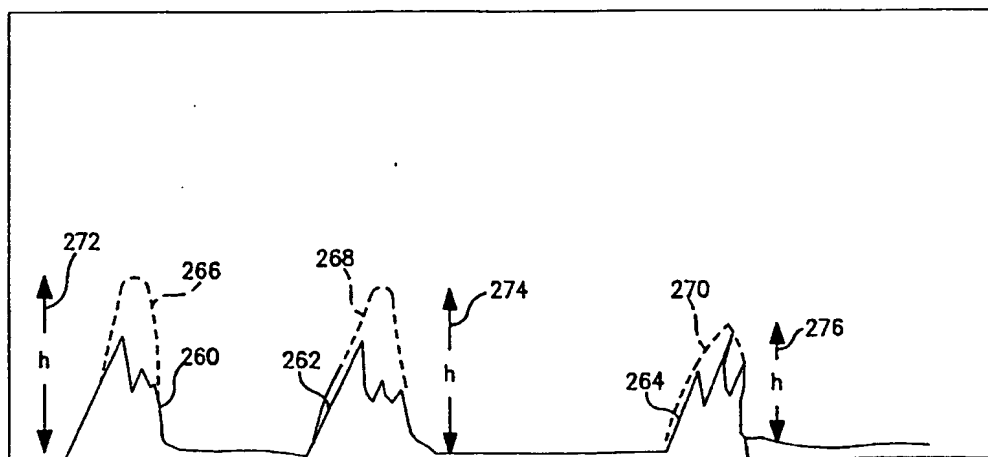


FIG. 49

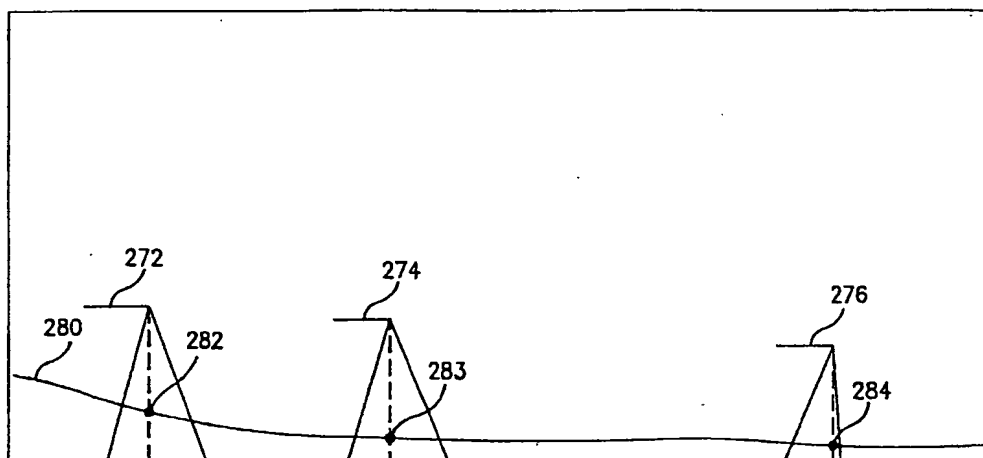


FIG. 50

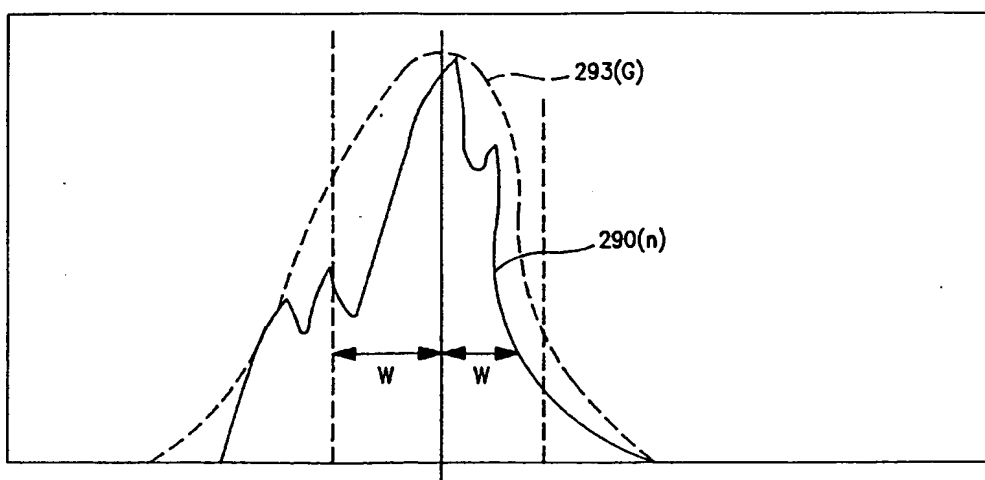
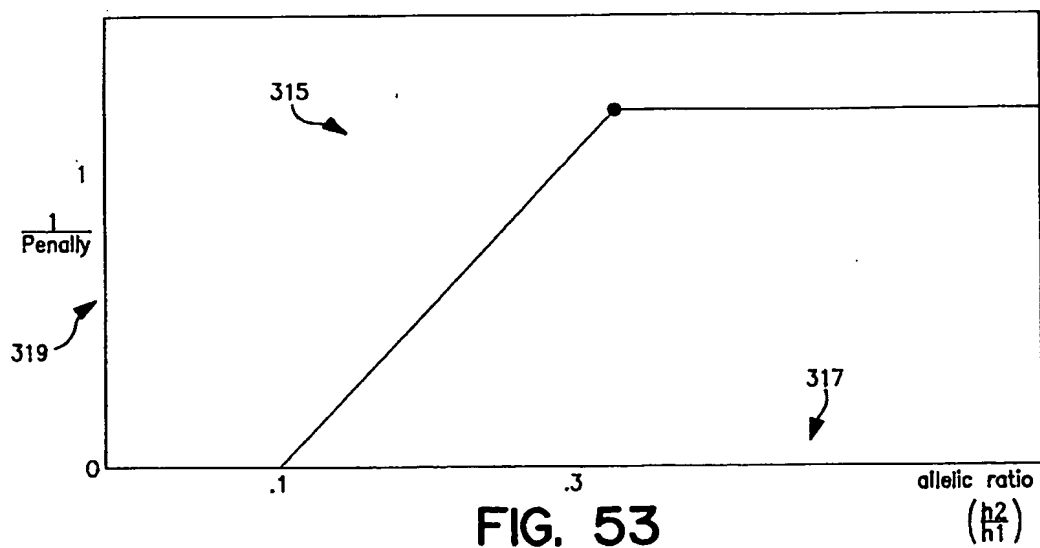
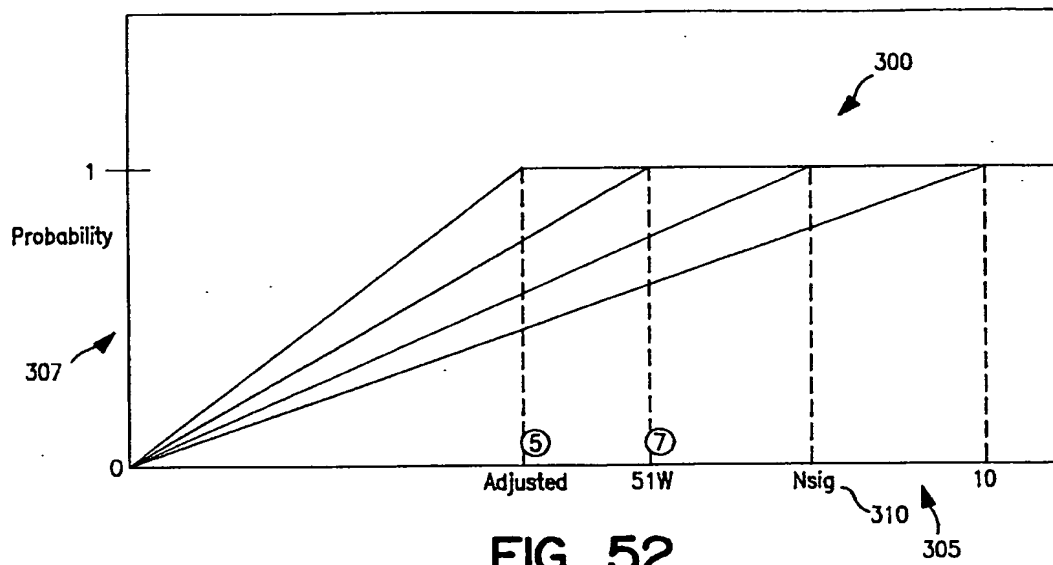


FIG. 51

47/51



48/51

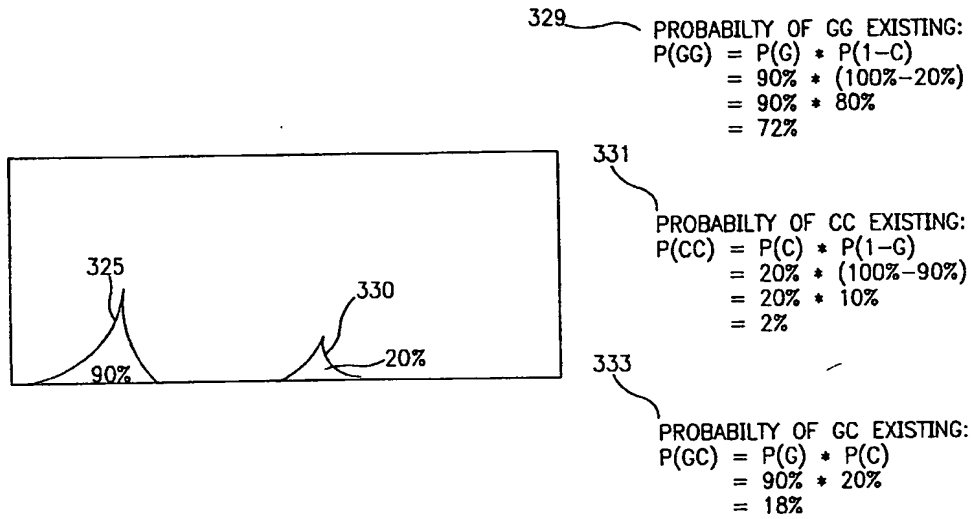


FIG. 54

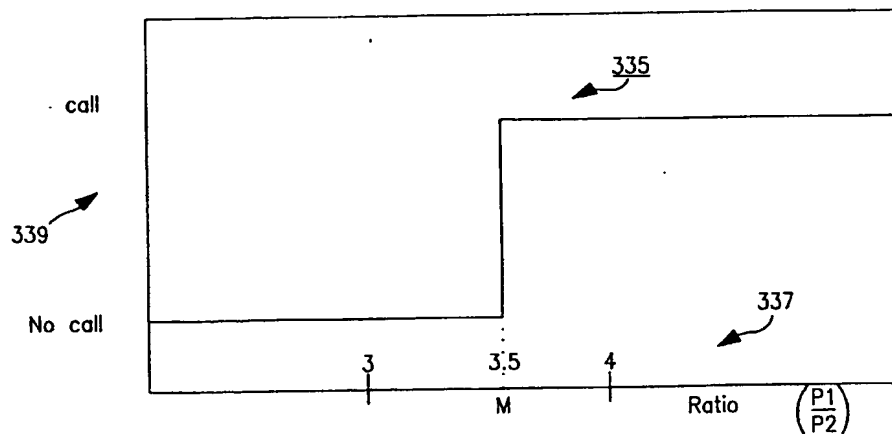


FIG. 55

49/51

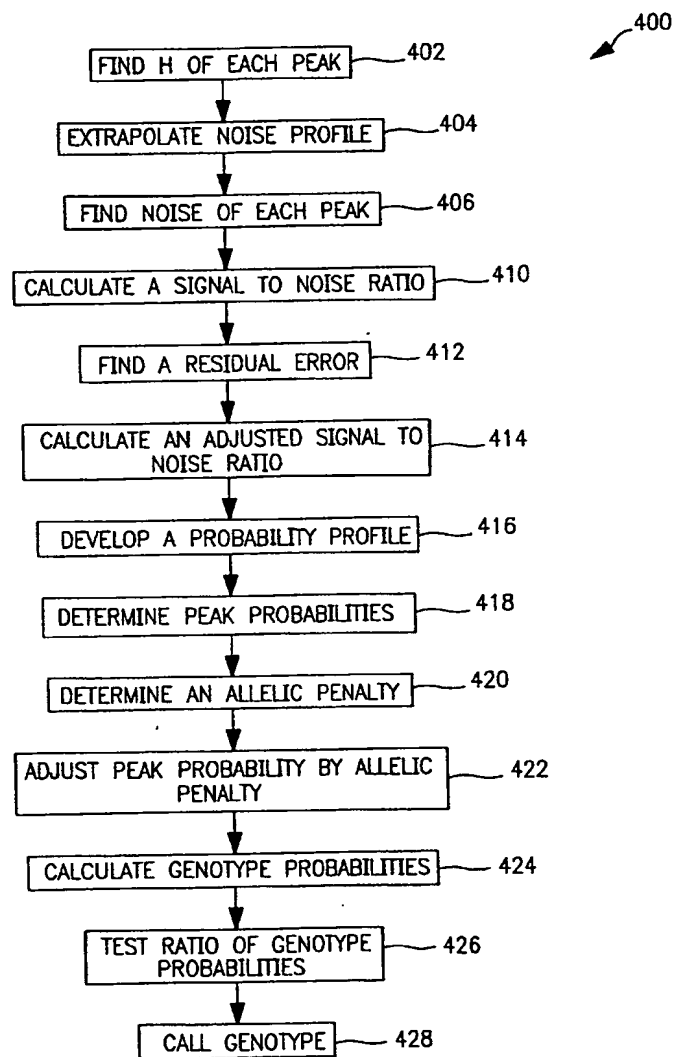


FIG. 56

50/ 51

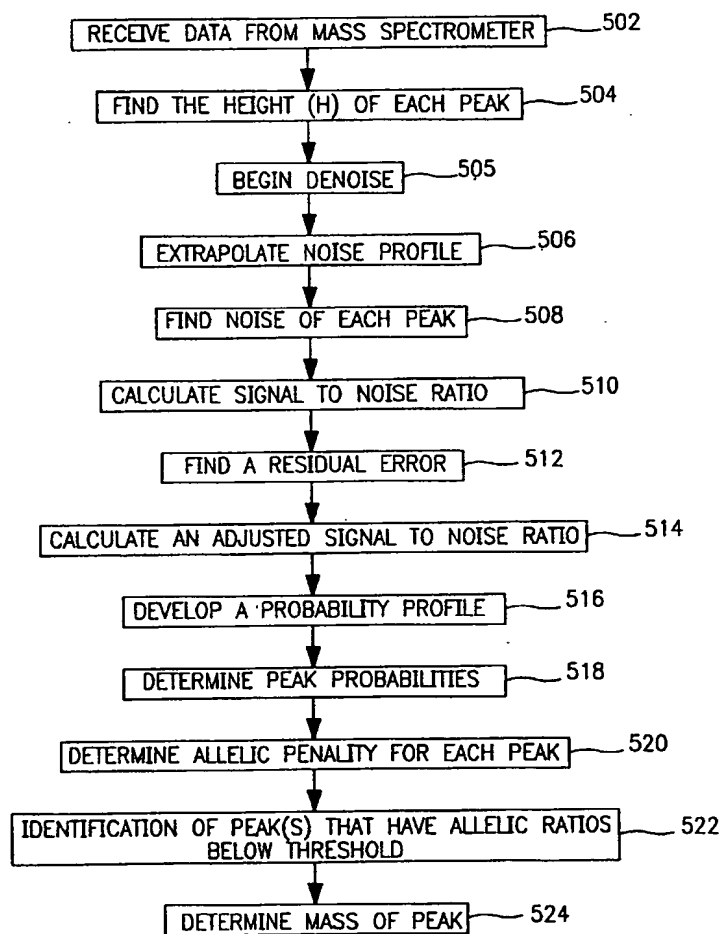


FIG. 57

51/51

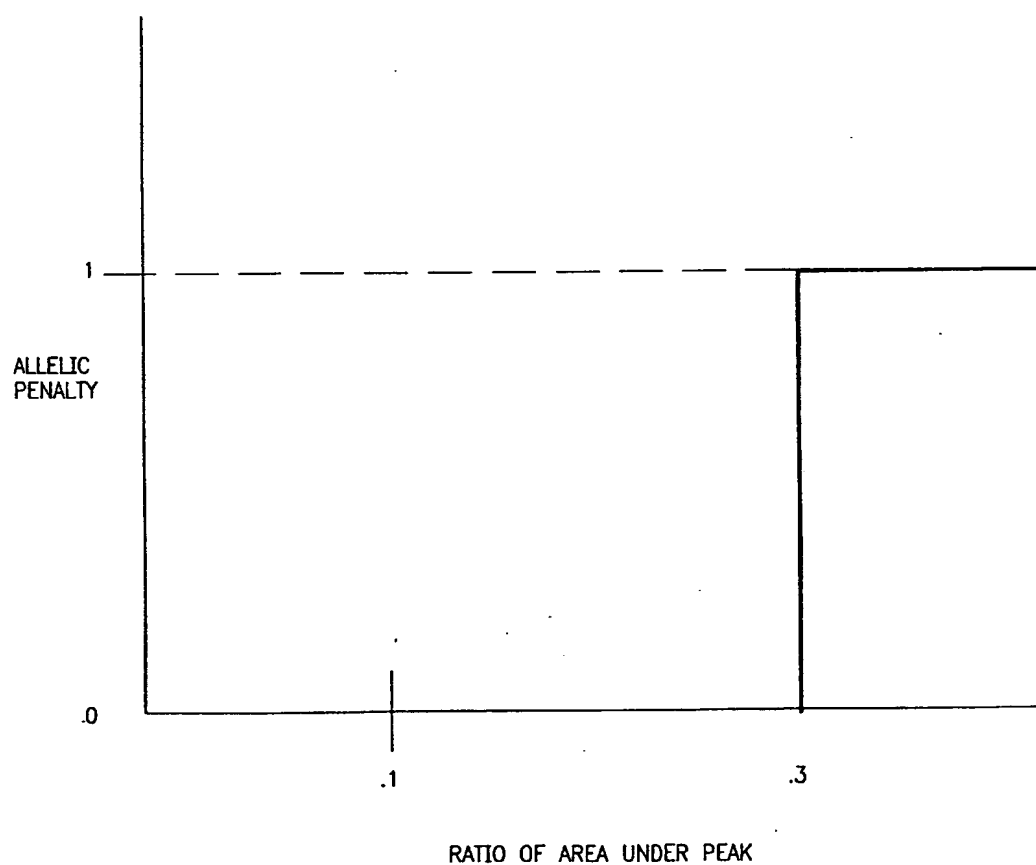


FIG. 58

SEQUENCE LISTING

<110> SEQUENOM
Braun et al.

<120> METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING
POLYMORPHIC GENETIC MARKERS

<130> 24736-2033PC

<140> Not Yet Assigned

<141> 2000-10-13

<150> 60/217,658

<151> 2000-07-10

<150> 60/159,176

<151> 1999-10-13

<150> 60/217,251

<151> 2000-07-10

<150> 09/663,968

<151> 2000-09-19

<160> 118

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 361

<212> DNA

<213> Homo Sapien

<400> 1

ctgaggacct	ggctcctctga	ctgctctttt	cacccatcta	cagtcacct	tgccgtccca	60
agcaatggat	gatttgatgc	tgtcccccga	cgatattgaa	caatggttca	ctgaagaccc	120
aggtccagat	gaagctccca	gaatgccaga	ggctgctccc	cgcgtggccc	ctgcaccagc	180
agctcctaca	ccggcggccc	ctgcaccagc	cccctcctgg	cccctgtcat	cttctgtccc	240
ttcccagaaa	acctaccagg	gcagctacgg	tttccgtctg	ggcttcttgc	attctgggac	300
agccaagtct	gtgacttgca	cggtcagttg	ccctgagggg	ctggcttcca	tgagacttca	360
a						361

<210> 2

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 2

cccagtcacg	acgttgtaaa	acgctgagga	cctggctctc	tgac	44
------------	------------	------------	------------	------	----

<210> 3

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 3

agcggataac	aatttcacac	aggttgaagt	ctcatggaag	cc	42
------------	------------	------------	------------	----	----

<210> 4

<211> 17

<212> DNA

2/122

<213> Artificial Sequence

<220>

<223> Probe

<400> 4

gccagaggct gctcccc

17

<210> 5

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Probe

<400> 5

gccagaggct gctcccc

17

<210> 6

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Probe

<400> 6

gccagaggct gctccccgc

19

<210> 7

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Probe

<400> 7

gccagaggct gctcccc

18

<210> 8

<211> 161

<212> DNA

<213> Homo Sapien

<400> 8

gtccgtcaga acccatgctg cagcaaggcc tgccgctgcc tcttcggccc agtggacagc 60
gagcagctga gccgctgactg tgatgcgcta atggcgggct gcatccagga ggcccgtgag 120
cgatggaaact tcgactttgt caccgagaca ccactggagg g 161

<210> 9

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 9

3/122

cccagtcacg acgttgtaaa acggtccgtc agaaccatg cgg 43

<210> 10
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 10
agcggataac aatttcacac aggctccagt ggtgtctcgg tgac 44

<210> 11
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 11
cagcgagcag ctgag 15

<210> 12
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 12
cagcgagcag ctgag 15

<210> 13
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 13
cagcgagcag ctgagc 16

<210> 14
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 14
cagcgagcag ctgagac 17

<210> 15
<211> 205
<212> DNA

4/122

<213> Homo Sapien

<400> 15
gcgctccatt catctcttca tcgactctct gttgaatgaa gaaaatccaa gtaaggccta 60
caggtgcagt tccaaggaag cctttgagaa agggctctgc ttgagttgta gaaagaaccg 120
ctgcaacaat ctgggctatg agatcaataa agtcagagcc aaaagaagca gcaaaatgta 180
cctgaagact cgttctcaga tgccc 205

<210> 16

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primers

<400> 16
cccagtcacg acgttgtaaa acggcgctcc attcatctct tc 42

<210> 17

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 17
agcggataac aatttcacac agggggcatc tgagaacgag tc 42

<210> 18

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 18
caatctgggc tatgagatca 20

<210> 19

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Probe

<400> 19
caatctgggc tatgagatca 20

<210> 20

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Probe

5/122

<400> 20
caatctgggc tatgagatca a 21

<210> 21
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 21
caatctgggc tatgagatca gt 20

<210> 22
<211> 60
<212> DNA
<213> Homo Sapien

<220>
<223> Probe

<400> 22
gtgccggcta ctcggatggc agcaaggact cctgcaaggg ggacagtgga ggcccacatg 60

<210> 23
<211> 60
<212> DNA
<213> Homo sapien

<400> 23
ccaccacta ccggggcacg tggtaactga cgggcatcgt cagctggggc cagggctgcg 60

<210> 24
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 24
cccagtcacg acgttgtaaa acgatggcag caaggactcc tg 42

<210> 25
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 25
cacatgccac ccactacc 18

<210> 26
<211> 43
<212> DNA
<213> Artificial Sequence

6/122

<220>
<223> Oligonucleotide primer

<400> 26
agcggataac aatttcacac aggtgacgat gcccgtcagg tac 43

<210> 27
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 27
atgccaccca ctacc 15

<210> 28
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 28
cacatgccac ccactaccg 19

<210> 29
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 29
cacatgccac ccactaccag 20

<210> 30
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 30
agcggataac aatttcacac agg 23

<210> 31
<211> 2363
<212> DNA
<213> Homo Sapien

<220>
<221> CDS
<222> (138) ... (2126)
<223> AKAP-10

7/122

<300>

<308> GenBank AF037439

<309> 1997-12-21

<400> 31

```

gcggcttggt gataatatgg cggctggagc tgcctgggca tcccaggagg gcggtggggc   60
ccactcccgg aagaagggtc ccttttcgcg ctagtgcagc ggcccctctg gacccggaag   120
tccgggccgg ttgctga atg agg gga gcc ggg ccc tcc ccg cgc cag tcc   170
          Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser
          1          5          10

ccc cgc acc ctc cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg   218
Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg
          15          20          25

cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc   266
Arg Lys Val Lys Gly Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser
          30          35          40

att aaa gct tca ata tcc gta cat tcc cca caa aaa agc act aaa aat   314
Ile Lys Ala Ser Ile Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn
          45          50          55

cat gcc ttg ctg gag gct gca gga cca agt cat gtt gca atc aat gcc   362
His Ala Leu Leu Glu Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala
          60          65          70          75

att tct gcc aac atg gac tcc ttt tca agt agc agg aca gcc aca ctt   410
Ile Ser Ala Asn Met Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu
          80          85          90

aag aag cag cca agc cac atg gag gct gct cat ttt ggt gac ctg ggc   458
Lys Lys Gln Pro Ser His Met Glu Ala Ala His Phe Gly Asp Leu Gly
          95          100          105

aga tct tgt ctg gac tac cag act caa gag acc aaa tca agc ctt tct   506
Arg Ser Cys Leu Asp Tyr Gln Thr Thr Lys Ser Ser Leu Ser
          110          115          120

aag acc ctt gaa caa gtc ttg cac gac act att gtc ctc cct tac ttc   554
Lys Thr Leu Glu Gln Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe
          125          130          135

att caa ttc atg gaa ctt cgg cga atg gag cat ttg gtg aaa ttt tgg   602
Ile Gln Phe Met Glu Leu Arg Arg Met Glu His Leu Val Lys Phe Trp
          140          145          150          155

tta gag gct gaa agt ttt cat tca aca act tgg tcg cga ata aga gca   650
Leu Glu Ala Glu Ser Phe His Ser Thr Trp Ser Arg Ile Arg Ala
          160          165          170

cac agt cta aac aca atg aag cag agc tca ctg gct gag cct gtc tct   698
His Ser Leu Asn Thr Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser
          175          180          185

cca tct aaa aag cat gaa act aca gcg tct ttt tta act gat tct ctt   746
Pro Ser Lys Lys His Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu
          190          195          200

gat aag aga ttg gag gat tct ggc tca gca cag ttg ttt atg act cat   794

```


8/122

Asp	Lys	Arg	Leu	Glu	Asp	Ser	Gly	Ser	Ala	Gln	Leu	Phe	Met	Thr	His	
205						210					215					
tca	gaa	gga	att	gac	ctg	aat	aat	aga	act	aac	agc	act	cag	aat	cac	842
Ser	Glu	Gly	Ile	Asp	Leu	Asn	Asn	Arg	Thr	Asn	Ser	Thr	Gln	Asn	His	
220					225					230					235	
ttg	ctg	ctt	tcc	cag	gaa	tgt	gac	agt	gcc	cat	tct	ctc	cgt	ctt	gaa	890
Leu	Leu	Leu	Ser	Gln	Glu	Cys	Asp	Ser	Ala	His	Ser	Leu	Arg	Leu	Glu	
				240					245					250		
atg	gcc	aga	gca	gga	act	cac	caa	gtt	tcc	atg	gaa	acc	caa	gaa	tct	938
Met	Ala	Arg	Ala	Gly	Thr	His	Gln	Val	Ser	Met	Glu	Thr	Gln	Glu	Ser	
			255					260					265			
tcc	tct	aca	ctt	aca	gta	gcc	agt	aga	aat	agt	ccc	gct	tct	cca	cta	986
Ser	Ser	Thr	Leu	Thr	Val	Ala	Ser	Arg	Asn	Ser	Pro	Ala	Ser	Pro	Leu	
		270					275					280				
aaa	gaa	ttg	tca	gga	aaa	cta	atg	aaa	agt	ata	gaa	caa	gat	gca	gtg	1034
Lys	Glu	Leu	Ser	Gly	Lys	Leu	Met	Lys	Ser	Ile	Glu	Gln	Asp	Ala	Val	
	285					290					295					
aat	act	ttt	acc	aaa	tat	ata	tct	cca	gat	gct	gct	aaa	cca	ata	cca	1082
Asn	Thr	Phe	Thr	Lys	Tyr	Ile	Ser	Pro	Asp	Ala	Ala	Lys	Pro	Ile	Pro	
300					305					310					315	
att	aca	gaa	gca	atg	aga	aat	gac	atc	ata	gca	agg	att	tgt	gga	gaa	1130
Ile	Thr	Glu	Ala	Met	Arg	Asn	Asp	Ile	Ile	Ala	Arg	Ile	Cys	Gly	Glu	
				320					325					330		
gat	gga	cag	gtg	gat	ccc	aac	tgt	ttc	gtt	ttg	gca	cag	tcc	ata	gtc	1178
Asp	Gly	Gln	Val	Asp	Pro	Asn	Cys	Phe	Val	Leu	Ala	Gln	Ser	Ile	Val	
			335					340					345			
ttt	agt	gca	atg	gag	caa	gag	cac	ttt	agt	gag	ttt	ctg	cga	agt	cac	1226
Phe	Ser	Ala	Met	Glu	Gln	Glu	His	Phe	Ser	Glu	Phe	Leu	Arg	Ser	His	
		350					355					360				
cat	ttc	tgt	aaa	tac	cag	att	gaa	gtg	ctg	acc	agt	gga	act	gtt	tac	1274
His	Phe	Cys	Lys	Tyr	Gln	Ile	Glu	Val	Leu	Thr	Ser	Gly	Thr	Val	Tyr	
		365				370				375						
ctg	gct	gac	att	ctc	ttc	tgt	gag	tca	gcc	ctc	ttt	tat	ttc	tct	gag	1322
Leu	Ala	Asp	Ile	Leu	Phe	Cys	Glu	Ser	Ala	Leu	Phe	Tyr	Phe	Ser	Glu	
380					385					390					395	
tac	atg	gaa	aaa	gag	gat	gca	gtg	aat	atc	tta	caa	ttc	tgg	ttg	gca	1370
Tyr	Met	Glu	Lys	Glu	Asp	Ala	Val	Asn	Ile	Leu	Gln	Phe	Trp	Leu	Ala	
				400				405						410		
gca	gat	aac	ttc	cag	tct	cag	ctt	gct	gcc	aaa	aag	ggg	caa	tat	gat	1418
Ala	Asp	Asn	Phe	Gln	Ser	Gln	Leu	Ala	Ala	Lys	Lys	Gly	Gln	Tyr	Asp	
			415					420					425			
gga	cag	gag	gca	cag	aat	gat	gcc	atg	att	tta	tat	gac	aag	tac	ttc	1466
Gly	Gln	Glu	Ala	Gln	Asn	Asp	Ala	Met	Ile	Leu	Tyr	Asp	Lys	Tyr	Phe	
		430				435						440				
tcc	ctc	caa	gcc	aca	cat	cct	ctt	gga	ttt	gat	gat	gtt	gta	cga	tta	1514

Ser	Leu 445	Gln	Ala	Thr	His	Pro 450	Leu	Gly	Phe	Asp	Asp 455	Val	Val	Arg	Leu		
gaa Glu 460	att Ile	gaa Glu	tcc Ser	aat Asn	atc Ile 465	tgc Cys	agg Arg	gaa Glu	ggg Gly	ggg Gly 470	cca Pro	ctc Leu	ccc Pro	aac Asn	tgt Cys 475	1562	
ttc Phe	aca Thr	act Thr	cca Pro	tta Leu 480	cgt Arg	cag Gln	gcc Ala	tgg Trp	aca Thr 485	acc Thr	atg Met	gag Glu	aag Lys	gtc Val 490	ttt Phe	1610	
ttg Leu	cct Pro	ggc Gly	ttt Phe 495	ctg Leu	tcc Ser	agc Ser	aat Asn	ctt Leu 500	tat Tyr	tat Tyr	aaa Lys	tat Tyr	ttg Leu 505	aat Asn	gat Asp	1658	
ctc Leu	atc Ile	cat His 510	tcg Ser	gtt Val	cga Arg	gga Gly	gat Asp 515	gaa Glu	ttt Phe	ctg Leu	ggc Gly	ggg Gly 520	aac Asn	gtg Val	tcg Ser	1706	
ccg Pro	act Thr 525	gct Ala	cct Pro	ggc Gly	tct Ser	gtt Val 530	ggc Gly	cct Pro	cct Pro	gat Asp	gag Glu 535	tct Ser	cac His	cca Pro	ggg Gly	1754	
agt Ser 540	tct Ser	gac Asp	agc Ser	tct Ser	gcg Ala 545	tct Ser	cag Gln	tcc Ser	agt Ser	gtg Val 550	aaa Lys	aaa Lys	gcc Ala	agt Ser	att Ile 555	1802	
aaa Lys	ata Ile	ctg Leu	aaa Lys	aat Asn 560	ttt Phe	gat Asp	gaa Glu	gcg Ala	ata Ile 565	att Ile	gtg Val	gat Asp	gcg Ala	gca Ala 570	agt Ser	1850	
ctg Leu	gat Asp	cca Pro	gaa Glu 575	tct Ser	tta Leu	tat Tyr	caa Gln	cgg Arg 580	aca Thr	tat Tyr	gcc Ala	ggg Gly	aag Lys 585	atg Met	aca Thr	1898	
ttt Phe	gga Gly	aga Arg 590	gtg Val	agt Ser	gac Asp	ttg Leu	ggg Gly 595	caa Gln	ttc Phe	atc Ile	cgg Arg	gaa Glu 600	tct Ser	gag Glu	cct Pro	1946	
gaa Glu	cct Pro 605	gat Asp	gta Val	agg Arg	aaa Lys	tca Ser 610	aaa Lys	gga Gly	tcc Ser	atg Met	ttc Phe 615	tca Ser	caa Gln	gct Ala	atg Met	1994	
aag Lys 620	aaa Lys	tgg Trp	gtg Val	caa Gln	gga Gly 625	aat Asn	act Thr	gat Asp	gag Glu	gcc Ala 630	cag Gln	gaa Glu	gag Glu	cta Leu	gct Ala 635	2042	
tgg Trp	aag Lys	att Ile	gct Ala	aaa Lys 640	atg Met	ata Ile	gtc Val	agt Ser	gac Asp 645	att Ile	atg Met	cag Gln	cag Gln	gct Ala 650	cag Gln	2090	
tat Tyr	gat Asp	caa Gln	ccg Pro 655	tta Leu	gag Glu	aaa Lys	tct Ser	aca Thr 660	aag Lys	tta Leu	tga *	ctcaaaaactt				2136	
gagataaaagg				aaatctgctt		gtgaaaaata		agagaactttt			tttcccttggtg			ttggattctt			2196
caacacagcc				aatgaaaaca		gcactatatatt		tctgatctgt			cactcttgtt			tccagggaga			2256
gaatggggag				acaattcctag		gacttccacc		ctaattcgagt			tacctgttagg			gcataattgg			2316
atggcacatg				atgtttcaca		cagtgaggag		tctttaaaagg			ttaccaaa						2362

10/122

<210> 32
 <211> 662
 <212> PRT
 <213> Homo Sapien

<400> 32
 Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg
 1 5 10 15
 Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg Arg Lys Val Lys Gly
 20 25 30
 Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser Ile Lys Ala Ser Ile
 35 40 45
 Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn His Ala Leu Leu Glu
 50 55 60
 Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala Ile Ser Ala Asn Met
 65 70 75 80
 Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu Lys Lys Gln Pro Ser
 85 90 95
 His Met Glu Ala Ala His Phe Gly Asp Leu Gly Arg Ser Cys Leu Asp
 100 105 110
 Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser Lys Thr Leu Glu Gln
 115 120 125
 Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe Ile Gln Phe Met Glu
 130 135 140
 Leu Arg Arg Met Glu His Leu Val Lys Phe Trp Leu Glu Ala Glu Ser
 145 150 155 160
 Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala His Ser Leu Asn Thr
 165 170 175
 Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser Pro Ser Lys Lys His
 180 185 190
 Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu Asp Lys Arg Leu Glu
 195 200 205
 Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His Ser Glu Gly Ile Asp
 210 215 220
 Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His Leu Leu Leu Ser Gln
 225 230 235 240
 Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu Met Ala Arg Ala Gly
 245 250 255
 Thr His Gln Val Ser Met Glu Thr Gln Glu Ser Ser Ser Thr Leu Thr
 260 265 270
 Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu Lys Glu Leu Ser Gly
 275 280 285
 Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val Asn Thr Phe Thr Lys
 290 295 300
 Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro Ile Thr Glu Ala Met
 305 310 315 320
 Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu Asp Gly Gln Val Asp
 325 330 335
 Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val Phe Ser Ala Met Glu
 340 345 350
 Gln Glu His Phe Ser Glu Phe Leu Arg Ser His His Phe Cys Lys Tyr
 355 360 365
 Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr Leu Ala Asp Ile Leu
 370 375 380
 Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu Tyr Met Glu Lys Glu
 385 390 395 400
 Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala Ala Asp Asn Phe Gln
 405 410 415
 Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp Gly Gln Glu Ala Gln
 420 425 430

11/122

Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe Ser Leu Gln Ala Thr
 435 440 445
 His Pro Leu Gly Phe Asp Asp Val Val Arg Leu Glu Ile Glu Ser Asn
 450 455 460
 Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys Phe Thr Thr Pro Leu
 465 470 475 480
 Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe Leu Pro Gly Phe Leu
 485 490 495
 Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp Leu Ile His Ser Val
 500 505 510
 Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser Pro Thr Ala Pro Gly
 515 520 525
 Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly Ser Ser Asp Ser Ser
 530 535 540
 Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile Lys Ile Leu Lys Asn
 545 550 555 560
 Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser Leu Asp Pro Glu Ser
 565 570 575
 Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr Phe Gly Arg Val Ser
 580 585 590
 Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg
 595 600 605
 Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln
 610 615 620
 Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys
 625 630 635 640
 Met Ile Val Ser Asp Ile Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu
 645 650 655
 Glu Lys Ser Thr Lys Leu
 660

<210> 33
 <211> 2363
 <212> DNA
 <213> Homo Sapien
 <220>
 <221> CDS
 <222> (138)...(2126)
 <223> AKAP-10-5

<221> allele
 <222> 2073
 <223> Single Nucleotide Polymorphism: A to G

<400> 33
 gcggcttggt gataatatgg cggttgagc tgctgggca tcccaggag gcggtggggc 60
 ccactcccgg aagaagggtc ccttttcgcg ctagtgcagc ggcccctctg gaccgggaag 120
 tccgggccgg ttgctga atg agg gga gcc ggg ccc tcc ccg cgc cag tcc 170
 Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser
 1 5 10
 ccc cgc acc ctc cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg 218
 Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg
 15 20 25
 cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc 266
 Arg Lys Val Lys Gly Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser
 30 35 40

12/122

att aaa gct tca ata tcc gta cat tcc cca caa aaa agc act aaa aat	314
Ile Lys Ala Ser Ile Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn	
45 50 55	
cat gcc ttg ctg gag gct gca gga cca agt cat gtt gca atc aat gcc	362
His Ala Leu Leu Glu Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala	
60 65 70 75	
att tct gcc aac atg gac tcc ttt tca agt agc agg aca gcc aca ctt	410
Ile Ser Ala Asn Met Asp Ser Phe Ser Ser Arg Thr Ala Thr Leu	
80 85 90	
aag aag cag cca agc cac atg gag gct gct cat ttt ggt gac ctg ggc	458
Lys Lys Gln Pro Ser His Met Glu Ala Ala His Phe Gly Asp Leu Gly	
95 100 105	
aga tct tgt ctg gac tac cag act caa gag acc aaa tca agc ctt tct	506
Arg Ser Cys Leu Asp Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser	
110 115 120	
aag acc ctt gaa caa gtc ttg cac gac act att gtc ctc cct tac ttc	554
Lys Thr Leu Glu Gln Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe	
125 130 135	
att caa ttc atg gaa ctt cgg cga atg gag cat ttg gtg aaa ttt tgg	602
Ile Gln Phe Met Glu Leu Arg Arg Met Glu His Leu Val Lys Phe Trp	
140 145 150 155	
tta gag gct gaa agt ttt cat tca aca act tgg tcg cga ata aga gca	650
Leu Glu Ala Glu Ser Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala	
160 165 170	
cac agt cta aac aca atg aag cag agc tca ctg gct gag cct gtc tct	698
His Ser Leu Thr Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser	
175 180 185	
cca tct aaa aag cat gaa act aca gcg tct ttt tta act gat tct ctt	746
Pro Ser Lys Lys His Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu	
190 195 200	
gat aag aga ttg gag gat tct ggc tca gca cag ttg ttt atg act cat	794
Asp Lys Arg Leu Glu Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His	
205 210 215	
tca gaa gga att gac ctg aat aat aga act aac agc act cag aat cac	842
Ser Glu Gly Ile Asp Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His	
220 225 230 235	
ttg ctg ctt tcc cag gaa tgt gac agt gcc cat tct ctc cgt ctt gaa	890
Leu Leu Leu Ser Gln Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu	
240 245 250	
atg gcc aga gca gga act cac caa gtt tcc atg gaa acc caa gaa tct	938
Met Ala Arg Ala Gly Thr His Gln Val Ser Met Glu Thr Gln Glu Ser	
255 260 265	
tcc tct aca ctt aca gta gcc agt aga aat agt ccc gct tct cca cta	986
Ser Ser Thr Leu Thr Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu	
270 275 280	

13/122

aaa gaa ttg tca gga aaa cta atg aaa agt ata gaa caa gat gca gtg Lys Glu Leu Ser Gly Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val 285 290 295	1034
aat act ttt acc aaa tat ata tct cca gat gct gct aaa cca ata cca Asn Thr Phe Thr Lys Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro 300 305 310 315	1082
att aca gaa gca atg aga aat gac atc ata gca agg att tgt gga gaa Ile Thr Glu Ala Met Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu 320 325 330	1130
gat gga cag gtg gat ccc aac tgt ttc gtt ttg gca cag tcc ata gtc Asp Gly Gln Val Asp Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val 335 340 345	1178
ttt agt gca atg gag caa gag cac ttt agt gag ttt ctg cga agt cac Phe Ser Ala Met Glu Gln Glu His Phe Ser Glu Phe Leu Arg Ser His 350 355 360	1226
cat ttc tgt aaa tac cag att gaa gtg ctg acc agt gga act gtt tac His Phe Cys Lys Tyr Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr 365 370 375	1274
ctg gct gac att ctc ttc tgt gag tca gcc ctc ttt tat ttc tct gag Leu Ala Asp Ile Leu Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu 380 385 390 395	1322
tac atg gaa aaa gag gat gca gtg aat atc tta caa ttc tgg ttg gca Tyr Met Glu Lys Glu Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala 400 405 410	1370
gca gat aac ttc cag tct cag ctt gct gcc aaa aag ggg caa tat gat Ala Asp Asn Phe Gln Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp 415 420 425	1418
gga cag gag gca cag aat gat gcc atg att tta tat gac aag tac ttc Gly Gln Glu Ala Gln Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe 430 435 440	1466
tcc ctc caa gcc aca cat cct ctt gga ttt gat gat gtt gta cga tta Ser Leu Gln Ala Thr His Pro Leu Gly Phe Asp Asp Val Val Arg Leu 445 450 455	1514
gaa att gaa tcc aat atc tgc agg gaa ggt ggg cca ctc ccc aac tgt Glu Ile Glu Ser Asn Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys 460 465 470 475	1562
ttc aca act cca tta cgt cag gcc tgg aca acc atg gag aag gtc ttt Phe Thr Thr Pro Leu Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe 480 485 490	1610
ttg cct ggc ttt ctg tcc agc aat ctt tat tat aaa tat ttg aat gat Leu Pro Gly Phe Leu Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp 495 500 505	1658
ctc atc cat tcg gtt cga gga gat gaa ttt ctg ggc ggg aac gtg tcg Leu Ile His Ser Val Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser 510 515 520	1706

14/122

ccg act gct cct ggc tct gtt ggc cct cct gat gag tct cac cca ggg	1754
Pro Thr Ala Pro Gly Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly	
525 530 535	
agt tct gac agc tct gcg tct cag tcc agt gtg aaa aaa gcc agt att	1802
Ser Ser Asp Ser Ser Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile	
540 545 550 555	
aaa ata ctg aaa aat ttt gat gaa gcg ata att gtg gat gcg gca agt	1850
Lys Ile Leu Lys Asn Phe Asp Glu Ala Ile Val Asp Ala Ala Ser	
560 565 570	
ctg gat cca gaa tct tta tat caa cgg aca tat gcc ggg aag atg aca	1898
Leu Asp Pro Glu Ser Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr	
575 580 585	
ttt gga aga gtg agt gac ttg ggg caa ttc atc cgg gaa tct gag cct	1946
Phe Gly Arg Val Ser Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro	
590 595 600	
gaa cct gat gta agg aaa tca aaa gga tcc atg ttc tca caa gct atg	1994
Glu Pro Asp Val Arg Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met	
605 610 615	
aag aaa tgg gtg caa gga aat act gat gag gcc cag gaa gag cta gct	2042
Lys Lys Trp Val Gln Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala	
620 625 630 635	
tgg aag att gct aaa atg ata gtc agt gac gtt atg cag cag gct cag	2090
Trp Lys Ile Ala Lys Met Ile Val Ser Asp Val Met Gln Gln Ala Gln	
640 645 650	
tat gat caa ccg tta gag aaa tct aca aag tta tga ctcaaaactt	2136
Tyr Asp Gln Pro Leu Glu Lys Ser Thr Lys Leu *	
655 660	
gagataaagg aaatctgctt gtgaaaaata agagaacttt tttcccttgg ttggattctt	2196
caacacagcc aatgaaaaca gcactatatt tctgatctgt cactgttggt tccagggaga	2256
gaatggggag acaatcctag gacttccacc ctaatgcagt tacctgtagg gcataattgg	2316
atggcacatg atgtttcaca cagtgaggag tctttaaagg ttaccaa	2363

<210> 34

<211> 662

<212> PRT

<213> Homo Sapien

<400> 34

Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg	
1 5 10 15	
Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg Arg Lys Val Lys Gly	
20 25 30	
Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser Ile Lys Ala Ser Ile	
35 40 45	
Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn His Ala Leu Leu Glu	
50 55 60	
Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala Ile Ser Ala Asn Met	
65 70 75 80	
Asp Ser Phe Ser Ser Arg Thr Ala Thr Leu Lys Lys Gln Pro Ser	
85 90 95	
His Met Glu Ala Ala His Phe Gly Asp Leu Gly Arg Ser Cys Leu Asp	

				100					105				110			
Tyr	Gln	Thr 115	Gln	Glu	Thr	Lys	Ser 120	Ser	Leu	Ser	Lys	Thr 125	Leu	Glu	Gln	
Val	Leu	His 130	Asp	Thr	Ile	Val 135	Leu	Pro	Tyr	Phe	Ile 140	Gln	Phe	Met	Glu	
Leu 145	Arg	Arg	Met	Glu	His 150	Val	Lys	Phe	Trp 155	Leu	Glu	Ala	Glu	Ser	160	
Phe	His	Ser	Thr 165	Trp	Ser	Arg	Ile 170	Arg	Ala	His	Ser	Leu	Asn 175	Thr		
Met	Lys	Gln 180	Ser	Ser	Leu	Ala	Glu 185	Pro	Val	Ser	Pro	Ser	Lys 190	Lys	His	
Glu	Thr	Thr 195	Ala	Ser	Phe	Leu	Thr 200	Asp	Ser	Leu	Asp	Lys 205	Arg	Leu	Glu	
Asp	Ser	Gly 210	Ser	Ala	Gln	Leu 215	Phe	Met	Thr	His	Ser 220	Glu	Gly	Ile	Asp	
Leu 225	Asn	Asn	Arg	Thr	Asn 230	Ser	Thr	Gln	Asn	His 235	Leu	Leu	Leu	Ser	Gln 240	
Glu	Cys	Asp	Ser	Ala 245	His	Ser	Leu	Arg	Leu 250	Glu	Met	Ala	Arg	Ala 255	Gly	
Thr	His	Gln 260	Val	Ser	Met	Glu	Thr 265	Gln	Glu	Ser	Ser	Ser	Thr 270	Leu	Thr	
Val	Ala	Ser 275	Arg	Asn	Ser	Pro	Ala 280	Ser	Pro	Leu	Lys	Glu 285	Leu	Ser	Gly	
Lys	Leu 290	Met	Lys	Ser	Ile 295	Glu	Gln	Asp	Ala	Val	Asn 300	Thr	Phe	Thr	Lys	
Tyr 305	Ile	Ser	Pro	Asp	Ala 310	Ala	Lys	Pro	Ile	Pro 315	Ile	Thr	Glu	Ala	Met 320	
Arg	Asn	Asp	Ile 325	Ile	Ala	Arg	Ile	Cys	Gly 330	Glu	Asp	Gly	Gln	Val 335	Asp	
Pro	Asn	Cys	Phe 340	Val	Leu	Ala	Gln	Ser 345	Ile	Val	Phe	Ser	Ala 350	Met	Glu	
Gln	Glu	His 355	Phe	Ser	Glu	Phe	Leu 360	Arg	Ser	His	His	Phe 365	Cys	Lys	Tyr	
Gln	Ile 370	Glu	Val	Leu	Thr	Ser 375	Gly	Thr	Val	Tyr	Leu 380	Ala	Asp	Ile	Leu	
Phe 385	Cys	Glu	Ser	Ala 390	Leu	Phe	Tyr	Phe	Ser	Glu 395	Tyr	Met	Glu	Lys	Glu 400	
Asp	Ala	Val	Asn 405	Ile	Leu	Gln	Phe	Trp	Leu 410	Ala	Ala	Asp	Asn 415	Phe	Gln	
Ser	Gln	Leu 420	Ala	Ala	Lys	Lys	Gly	Gln 425	Tyr	Asp	Gly	Gln	Glu 430	Ala	Gln	
Asn	Asp 435	Ala	Met	Ile	Leu	Tyr	Asp 440	Lys	Tyr	Phe	Ser	Leu 445	Gln	Ala	Thr	
His	Pro 450	Leu	Gly	Phe	Asp	Asp 455	Val	Val	Arg	Leu	Glu 460	Ile	Glu	Ser	Asn	
Ile 465	Cys	Arg	Glu	Gly 470	Gly	Pro	Leu	Pro	Asn	Cys 475	Phe	Thr	Thr	Pro	Leu 480	
Arg	Gln	Ala	Trp 485	Thr	Thr	Met	Glu	Lys 490	Val	Phe	Leu	Pro	Gly 495	Phe	Leu	
Ser	Ser	Asn 500	Leu	Tyr	Tyr	Lys	Tyr	Leu 505	Asn	Asp	Leu	Ile 510	His	Ser	Val	
Arg	Gly 515	Asp	Glu	Phe	Leu	Gly	Gly 520	Asn	Val	Ser	Pro	Thr 525	Ala	Pro	Gly	
Ser	Val 530	Gly	Pro	Pro	Asp	Glu 535	Ser	His	Pro	Gly	Ser 540	Ser	Asp	Ser	Ser	
Ala 545	Ser	Gln	Ser	Ser	Val 550	Lys	Lys	Ala	Ser	Ile 555	Lys	Ile	Leu	Lys	Asn 560	
Phe	Asp	Glu	Ala 565	Ile	Ile	Val	Asp	Ala 570	Ala	Ser	Leu	Asp	Pro	Glu 575	Ser	
Leu	Tyr	Gln	Arg	Thr	Tyr	Ala	Gly	Lys	Met	Thr	Phe	Gly	Arg	Val	Ser	

16/122

580 585 590
 Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg
 595 600 605
 Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln
 610 615 620
 Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys
 625 630 635 640
 Met Ile Val Ser Asp Val Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu
 645 650 655
 Glu Lys Ser Thr Lys Leu
 660

<210> 35
 <211> 162025
 <212> DNA
 <213> Homo Sapien

<300>
 <308> GenBank AC005730
 <309> 1998-10-22

<400> 35
 gaattccttat ttcaaaagaa acaaatgggc caagtatggt ggctcatacc tgtaatccca 60
 gcactttggg aggcgaggt gagtgggtca cttgaggtca ggagtccag gccagtctgg 120
 ccaacatggt gaaacactgt ctctactaaa aatacaaaaa ttagccgggc gtggtggcgg 180
 gcacctgtaa tcccagctac tcaggaggct gaggcaggag aattgcttga acctgggaga 240
 tggaggttgc agtgagccga gatcgcgcca ctgctctcca gcctgggtgg cagagtggaga 300
 ctctgtctca aaaagaaaaca aagaaataaa tgaaacaatt ttgttcacat atatttcaca 360
 aatttgaaat gttaaaggta ttatggtcac tgatattcctg ttctattctt tatataatca 420
 ttaagtttga aatgtatact tgcactacta acacagtagt taatcttagt cctacaagtt 480
 actgctttta cacaatatat ttctgtaata tgtatgcact ggtgtttatg tacgtgttta 540
 tgtttatatt tgttaaaatt agcagtttcc atctttttct attttgtacc atcacatcag 600
 ttcagaagga ttgacagagc aaaatgattt gatgaagtat aaaagtcaca tgggtgagtg 660
 cataaataca actctgaaca attaggaggt tcactattga ctggaactaa actgcaagcc 720
 agaaagacac atatcctata tgtcaagaga tgtaccacc aggagttta agaagggaag 780
 tacacataga aagcacaatg gtgaataatt aaaaaattgg aatttatcag acactggatt 840
 cacttgctcc taaagtcaga gtcctctatt gtttttttgt ttttgtgggt ttctttttta 900
 atttttttat tttttgtaga gtcggagtct cactgtgtta cccgggctgg tctagaactc 960
 ctggcctcaa acaaacctcc tgcctcagct tcccaagca ttgggattac agacatgagc 1020
 cactgagccc agcccagacg ctttagcatt tatgaagctt ctgaaatagt tgtagaaacc 1080
 gcataagctt tccatgtcac tttcaaagt ttgatggtctc tttagtaaac caaccaagtt 1140
 attcctcaag ggcaaaataa catttctcag tgcaaaactg atgcacttca ttaccaaag 1200
 gaaaagacca caactataga ggcgtcattg aaagctgcac tcttcagagg ccaaaaaaaa 1260
 aggtacaaac acatactaat ggaacattct ttagaagagc cccaaagtta atgataaaca 1320
 ttttcatcaa agagaaaaga gaacaagggtg ttagcaaatt cctctatcaa ataacactaa 1380
 acatcaagga acatcaatgg catgccatgt ggaagaggaa gtgctagctc atgtacaaac 1440
 cagtagataa tttcaacttg ctgccgaatg aaacctctt gcaagggtatg aatcagcact 1500
 tctcatgttt gttttgcttt gttttgtttt gtttttagag acaggccctt gctctgtcac 1560
 acaggctgga gtgcagtggc acgatcagag ctactgcaa cctgaaactc ctgggctcaa 1620
 gggatcctcc tgccttagcc tcccaagtag ctgggactac agggccacca tgcccagcta 1680
 attttttaaa ttttctatag agatgggatc tctactagcac ctttcatggt tgatgttcat 1740
 atacaacgac caaggtacaa tgtggaaaag ggtctcagg atctaaaagt aaggaggacc 1800
 agaaagaaaa ggggttgcta catagagtag aagaagttgc acttcatgcc agtctacaac 1860
 actgctgttt tcctcagagc agagttgatg atctaaaatca ggggtcccca acccccagtt 1920
 catagcctgt taggaaccgg gccacacagc aggaagtgag caataggcaa gcgagcatta 1980
 ccacctgggc ttcacctccc gtcagatcag tgatgtcatt agattctcat aggaccatga 2040
 accctattgt gaactgagca tgcaagggat gtaggttttc cgctctttat gagactctaa 2100
 tgccggaaga tctgtcactg tcttccatca ccttgagatg ggaacatcta gttgcaggaa 2160
 aacaacctca gggctcccat tgattctata ttacagtgag ttgtatcatt atttcattct 2220
 atattacaat gtaataataa tagaaataaa ggcacaatag gccaggcgtg gtggctcaca 2280

17/122

cctgtaatcc	cagcacttcg	ggaggccaag	gcaggcggat	cacgagggtca	ggagatcgag	2340
accatcctgg	ctaaaaacgg	gaaaccccg	ctactaaaaa	ttcaaaaaaa	aattagccgg	2400
gtgtggtggt	gggcacctgt	agtcccagct	actcgagagg	ctgaggcagg	agaatggtgt	2460
gaacctggga	ggcagagctt	gaggtaaagg	gagatcacgc	cactgcactc	cagcctgggc	2520
gacagagcga	tactctgtct	caaaaaaaaa	aaaaaaaaaa	aaagaaataa	agtgaacaat	2580
aaatgtaatg	tggctgaatc	attccaaaac	aatcccccca	ccccagttca	cggaaaaaatt	2640
ctcccacaaa	accagtccct	ggtgccaaaa	agggtgggga	ccgctaattc	aaataatcta	2700
atcttcatte	aatgctaaaa	aatgaataaa	ctttttttta	aatacacggg	ctcactttgt	2760
tgcccaggct	ggagtacggg	ggcatgatca	cagctcactg	tagcctcaat	caccagggcc	2820
ccagcgatcc	tcccacctaa	acttcctgag	tagctgggac	tacaggcacg	caccacctg	2880
cccagctaata	ttttaaat	tttatagaga	tgggggtctc	accatggtgc	ccagactggg	2940
ctcaaacctt	gggctcaagt	gatcctccct	caaactcctg	gactcaagtg	atcctccttc	3000
cttggccctc	caaagtgtcg	ggattacaag	atgggccac	tgtaccagc	tggataaaca	3060
ttttaagtcg	cactacagtc	atggacaatc	aggcttttca	acatgcagta	tggacagtga	3120
gtcccagggt	ctgcttttcc	atactgaaat	acatgtgata	ctaaggagaa	agggtgctcg	3180
aaggatattt	aaaatgaaga	atatttaaaa	taggaaaaaa	actggttctt	catgactttg	3240
ataaggctga	taaaagacct	ttctgtgac	tcagggtgatt	cactcaagta	gtatatattca	3300
gtaatcatta	tctggaacag	cctgaaatct	aacccaaaata	ccatgatatt	ttaatgtctg	3360
tatgatacct	tgatgatag	acccaaactg	aatgtaggca	gctaaatctc	cacgagtttg	3420
acttccccga	gagttgacag	ttttcttcac	aaatataaga	aatataattt	ttgatacatg	3480
attggcatat	ttaaaaacta	cactgaaatg	ctgcaaaatg	atataaagaa	acattttcca	3540
gaatcaaatg	acatcaaaag	gtggattagg	aatctactca	ccattatcaa	ctaaatagaa	3600
acacttgagg	tgggtgtggg	ggctcacatc	gtaatctca	gcactttggg	aggccaaggc	3660
agggtgattg	cttgaggcca	ggagctcaag	accagcctga	gcaacatagc	aaaactctgt	3720
ctctacaaaa	aaaaaaaaaa	attaaccagg	catgggtggc	gatgcttgta	atcccagcta	3780
ctctggaagc	tgaagtagga	ggactgcttg	agcccaggag	atcaagactg	cagttagccg	3840
tgggtcatgt	gcgcccacagc	ctgagtgaca	gagagagacc	ctgtctcaaa	aacaaaaaca	3900
aacaaaaaac	acttaacctt	cctgtttttt	gctgttgttg	ttgttgtttg	tttgttttga	3960
gatggagtct	cactctgttg	cccaggctgg	agtgacagtg	cgtgatcttg	gctcactgca	4020
agctctgcct	cccgggttca	cgccattctc	ctgcctcagc	ctcccagagta	gctgggacta	4080
taggcgcccc	ccaccagcc	cggctacttt	tttgcatttt	tagtagagat	ggggtttcac	4140
cgtgttagcc	aggatggtct	tgatctcctg	acctcgatg	ccacctgcct	cggcctccca	4200
aagtgtcggg	attacaggca	tgaagccacc	caccgcggca	acctttctgt	tttttagttt	4260
gatctacttg	ttaaactcagc	agctgaaaga	atgctgaaag	tggccttcag	taaaaaaatt	4320
tcactagaat	ctctacatcc	atatttaatc	tgaatgcata	tccagattga	tcagttagag	4380
caaaaaacact	catcatcat	cctgatgacc	tctaattctg	gtttcggctt	tctatttcaa	4440
tggaaacaga	ataaggaaag	aaatggaagg	cctctggaaa	tttgtcctgg	gctatagata	4500
ctatcaaaaga	tcaccaacaa	taagatctct	gctataaata	taaaaacaag	ataatttaatt	4560
tttttaattat	ttttttctct	tcagaggatt	ttatttcaag	ataaaacata	acttctaccc	4620
atactattga	ttccaaaagg	tagaaaaagt	gtttttctct	atcttatcct	tcaaagaggt	4680
cacagcaatg	caaacatcta	taaaatgcct	ctgcataatt	gtcagaagct	atagtccaga	4740
aatcattgaa	aatgcttttc	cattttaagc	ttaggtgagg	tgtcttagga	aacctctatg	4800
acaacttact	ctatttattg	ggaggtaaac	tccagactc	tcccagggtc	tcctgtattg	4860
atctcatttt	ttaggcttcc	taatcccttg	aagcacatc	gaaaaagccc	tggatctctt	4920
ttctgcacat	atcatcgcg	aatcattcgg	gcttccagca	agctgacact	ccatgatata	4980
agcggcctcg	cccttctccg	gacgccagtc	cttgcgcgg	ttagctagga	tgagggggtt	5040
gctgggcttc	agtcagggt	tctgcgggtt	cccaagccgc	accagggtgg	ctcacagggt	5100
ggatgtcacc	attgcacact	gagctcctgg	caggctgtac	caatttttta	attatttaatt	5160
atttattttt	aaaattatgg	tgaattttt	ggatttctgc	tctaaaaatg	gcccataaatt	5220
gcacagcaga	tatctcttgg	aaccacagc	tttccactgg	aagaactaag	tatttttctt	5280
ttaaagatgc	tactaagtct	ctgaaaagtc	cagatcctct	acctctttcc	atcccaaact	5340
aagacttgga	atttatgaga	gatctagcta	acagaaatcc	cagacacatc	attggttctt	5400
cccagagtgc	agtcctccta	aagaggctca	gccctaagca	ggcccctgca	ccaggagggt	5460
gggtctgaga	cccacatagc	acttcccaag	gtgcatgctc	cagagaggca	ctgaaacagc	5520
tgagcacaag	cctgcaagcc	tggagaactc	tcacagtcag	aacggagggg	gccagtgagg	5580
actaacataa	agagaaaagg	gaacacagag	aatgtgagtg	caccaacaac	cagcaaaagg	5640
ttcatggcca	atgaaagcat	cagtgacggg	gccagaaccc	tcatcccaaa	agactcttca	5700
ctgcctttag	tgaaaaacaa	tggctagaga	gtgaagttaa	gatcatgtat	agagaggtaa	5760
agttacattt	tttatctctg	actctgctaa	tgtgaaatcc	cctatctgct	agactaaaag	5820
tttcagacac	cctgttcaaa	tatcccatata	gttgctagag	acttaaaatg	aacagaacgc	5880

18/122

acattgtcag	gatgactatt	acccaaaaat	caaaagacag	caagtattgg	tgaggatgta	5940
gagaaactgg	aactttttgtg	cactgtttat	gagaatgtaa	aatggagcag	ctgctgtgga	6000
aaagagtatg	caggttcctc	aaagagttaa	accaagatgt	ggaaacaact	aaatgccccat	6060
cagtggatga	aggggtagac	aatatgtggt	atatacatat	catggagtac	tattcagcct	6120
ctaaaaaaa	aaaaggaaat	tctataacat	gcaacagcat	ggatgaatct	tgaggacatt	6180
ttgctaata	aataaggcag	tcatagaaa	acaaatactg	cacgactcca	cttatatgag	6240
ataccaaaa	tagacaaatt	catagaatca	aagagtacaa	tggaggttac	ctggagctgc	6300
agggcgggaa	acgaggagtt	actaatcaac	gaacataacg	ttgcagttaa	gtaagatgaa	6360
taagctctca	agatcagctg	tacaacactg	tacctagagt	caacaataat	gtattgtaca	6420
cttaaaaaat	tgttaagggt	agattaacaa	atgtagtaga	tccacaaaatg	tggttaagt	6480
ttcttaccac	agtaaaaata	aaaaagaata	tcaagcccag	gagttcgaga	ctagcctggg	6540
taacatggtg	aaacctgtgc	tctacagaaa	atacaaaaaat	tagccagctg	tggaggtgca	6600
ctcctaggga	ggctgagggt	ggaggcttgc	ttgagcccag	gaggtcaagg	ctgcagttag	6660
ccatgatgtc	accactgtac	tccagcccag	atgacagagc	aagacaccac	cccccccaaa	6720
aaaagaaaaa	gaatatcaaa	catttttaaaa	gatcagatac	gcaagaacaa	caacaaaaaa	6780
gagatgaaca	gagcatcgac	cctcatctag	tggttctctt	ggtctaaactg	aaaaacagac	6840
attgagagac	aaacaatgac	agtgatgtga	tcacagcaat	tacacaggta	tccccctggg	6900
actgcagaag	aaaggaggaa	tgccctaactt	tcagaaaaata	gagaaagcgt	caaacagttg	6960
ctgaaagcct	tccaaaacta	gagagaactg	cacacaccaa	atcacagaaa	gaagaaaagc	7020
cgtaggggat	tctgggaccc	accggctatt	tttgatggct	gaacaccctg	ctgcaggaga	7080
gacaggagct	ggaaaagcatg	gtgggatgaa	acctcaaaaca	gctttgctctg	cattgcttaa	7140
gatcagctgg	cttgattaac	tctagtcaat	ggggacaatt	caatcaaaga	agaaagatgc	7200
tcaaatctac	attttagaat	gattttttat	ggcagtatgg	ggaatagatt	aaaagagagt	7260
gaagctggag	gcaagaaact	tgttaagagg	caactgaaac	agtctagatg	ataaaataata	7320
aactgcagac	gtgactagaa	aaatcagaac	aggctgaatc	aacagatacc	tagatgaaaa	7380
taacaggact	tgatcaccag	ttgtatcttg	gagaggaagg	agttgtttcc	ttgctttccc	7440
tacgactggg	aatacgggaag	gtttgcccgtg	tgtatttggt	atatactggg	gtgtagccaa	7500
tcactgacaa	ccatttagca	gcttaaaaca	caaaggctta	tctcccagtt	tctgtgggccc	7560
aggaatctaa	gataggctta	gctggctggg	tctggctcag	agtttctcaa	gaggttgcaa	7620
tcaagatgtc	agctgggggt	gcacatctctg	aaggctcaac	tggggcccgga	gggtccactt	7680
ccaaggagtt	cactcacctg	cctgacaagg	cagtgtggt	tgttggcagg	agatctcaat	7740
tcattgcca	gtgagcctct	ctatagcatt	gctggaacat	cctccccatc	tggcagttgg	7800
cttctctcag	catgagtgat	ctgagagaga	gagcaaggag	gaagccacag	tgctctctct	7860
actctactc	ctaacactat	ggacctactc	ctaacactct	cacttctgcc	ttattccatt	7920
agttagaag	ggaactaagc	tccacctctt	gaaataagaa	gtgtcaaaga	atttgtggat	7980
atatttaaaa	atcatcacac	tgtgggaagt	gatagggggg	tcaattaatg	ctgaacttga	8040
aatgcctgag	ccattcaaat	gtccaacagg	caatgaacat	acccatagat	ggctcatgact	8100
ttagcaagaa	tagaggaaga	tcacagaatt	aaggaggaat	tgaagggtaa	aagaagtggg	8160
gtcagattcc	ccctgaaaag	tgagccatga	aaggaaactt	aactattgag	ttagagggtca	8220
gagtaggaaa	tttcggtgga	attctttttt	aaagaaaagg	accatataag	catgttttga	8280
ggtagagggg	gaataaatca	gtagacaggg	agaggtaaaa	aacataaatg	ataggggata	8340
gttgacaaa	gtcttggcag	aatcccttac	ccattgactt	ggggccaaga	gagggacact	8400
tctttgtttg	agggataagg	aaaataagaa	agaatgggtg	ctatttagtg	tggctctgtc	8460
tctagggcaa	acgcataggt	aacaaactgt	gtgtgttagg	aatatagatg	tgacctcaca	8520
ttgagattct	cacctcaaat	ccattttgtt	gttacctgta	ccttcctacc	ttctcttttt	8580
gctacatgca	gactgctgtt	ttgtcttctt	ggcctgttcc	aggtttcagc	attctggcat	8640
atctgttacc	ctgttcccaa	acctctctag	agtcctatgt	ccttccttgg	atagtgtttg	8700
attgggccac	gtatctaaga	agtgatgcct	tcagttaggc	ctgagaacct	cctctatgga	8760
aatctccatc	agtgaccctg	acagacttgg	tatcttggag	atgtcactgc	tcccagcctg	8820
tggcttagga	tctgtctcagc	ctgggcctct	agtagtatgg	ataaggcgtt	aagggtatctt	8880
tgaaccagag	tctgtcatat	tcttcaatgt	gggacagata	aaacagtggg	agtgtctggg	8940
tttctgagct	agaactctgg	tttttggctt	aggttctttg	atgtatgacc	tttcagaggt	9000
attaaaattt	gttctaatac	aatgttcaat	acaaatgtag	ttccttttct	gttaggacct	9060
caacaaaaa	tgaccaactg	tagatgaaca	ttaaactatg	acaattcatg	gaaatgaata	9120
cagtaatacc	tgcggttccc	ccatttttagc	agtcactatg	gtgacatttg	gcacaaatgg	9180
ctatttaagg	tgctttttgt	taaaacctac	catcttacta	ggcacatgat	attgaaaacta	9240
atgaaataat	ggagaaactt	cttaaaaact	tttaatgaat	aaagtatgga	agtataataa	9300
ttttagctgc	tatttataaa	gtgactatta	caggtcaaac	attcttctag	ggtttttttg	9360
ttgaagtgtg	cacattttaa	ccttaataac	ccactatgag	tcaggttatc	ttctctcccc	9420
tttgagacagt	tggggaaatg	ggggtcagag	aggttaggta	atttgcctcag	ggccacacaa	9480

19/122

cctgcatgta	gaaaatctga	gatttgtaca	ggaacgtatc	aaactctgaa	gtccatgctt	9540
ctatttttccc	atgctgcctt	tctaataaaa	ggtaactaat	gctactggat	gctgccccca	9600
aagtggagtca	cttttcacccc	accctacttg	attttctcca	taaaactaat	cacatcctga	9660
caacttattt	attgctgatc	tccccacta	gattataaac	tcaataaaaag	caagatcctt	9720
gtctgctgaa	tatcagtagc	taaaacgctg	tctagcacag	agcaagtaat	taatatttgt	9780
tgaatgaaca	aataaaggaa	aaaaattcaa	aggaagaaaa	agccctaaaa	cagatgttta	9840
cctaaacata	catttttaaaa	gaaagcatat	aacaaattca	ggacagaatt	taaatttgat	9900
tttttaaaaa	aataaccaag	tgctagctgg	gcacagtggc	tcacacctgt	aatcctagca	9960
ctctggggagg	ccgaggcagg	cagatcactt	gaggtcaaga	gttcaagacc	agcctggcca	10020
acatggtgaa	acctgtctct	actaaaaata	cagaaattat	ccaggcatgg	tggcaggtcc	10080
ctgtaacccc	agctactcag	gaggctgagt	caggagaatt	gcttgaaccc	aggaggcaga	10140
ggttgcagtg	ggccaagatt	gcaccactgc	actccagcct	gagtaacaaa	gcaagactct	10200
gtctgaagga	gaaggaaaaga	aagaaggaaa	gaaggaaaaga	aggaaagaaag	gaaagaagga	10260
aagaaagaaa	gaaagaaaaga	aagaaagaaa	gaaagaaaaga	aagaaagaaa	gaaagaaaaga	10320
aagaaagaaa	aagaaagaaa	gaaagaaaaga	accaagtgtc	tatttggggac	ctactatgct	10380
atgttttttcc	atgcacgcta	ttttcagtaa	agcagttagc	aaacttgcaa	gatcataaca	10440
acaaaatata	gtcttctata	ctctataaat	gtgctttaag	aagttcctct	ttaccagctc	10500
atgtatgcat	tagtttttcta	agagttacta	gtaacttttt	ccctggagaa	tatccacagc	10560
cagtttattt	aaccaaagga	ggatgcttac	taacatgaag	ttatcaaatg	tgagcctaag	10620
ttggggccagt	tcagtgttaat	atactccaga	acaaaaacca	tcctactgtc	ctctgacaat	10680
ttacctgaa	aattcatttt	ccacattacc	aaggagccag	ggtaggagaa	tatagaaaga	10740
ccacccaaga	atccttactt	ctttcagcaa	aatcaattca	aagtaggtaa	ctaaacacat	10800
gcctaacaac	ctagaccag	attgtgctca	gaagaatgat	ctacaacatc	ttactgtgaa	10860
ggaactactg	aaatattcca	ataagacttc	tctccaaaat	gattttattg	aatttgcatt	10920
ttaaaaaata	ttttaagcct	aaattttaaa	aggtttgata	ttggtacatg	aatagacaaa	10980
cagacatgga	ctagaccaag	aatacatata	aaacatatat	aggaatttaa	tatacgataa	11040
atctagtagt	ccaaaggaac	caacaaatgg	tgttcagaca	gcaggatagg	catcaggaaa	11100
aacacagttg	ggcaccctac	cttactccta	acaccaggag	taactgaagg	agcaccaaat	11160
gtttattttat	tttaattata	gttttaagtt	ctaggggtacg	tggtgcacaac	atgcaggttt	11220
attacatagg	tatacatgtg	ccatgttggt	gaggagcacc	aaatatttta	aagaaaaaaa	11280
ttggccaggg	gcggtggctc	acacctgtaa	tcccagcact	ttgggaggcc	aaggtgggca	11340
gatcacctga	ggctggggagt	tcgagaccag	cctgagcaac	atggagaaaac	cccattctta	11400
ctaaaaatata	aaaatttagcc	aggcatgggtg	gcacatgcct	gtaatcccag	ctacttggga	11460
ggctgaggga	ggagaatagc	tttaatctgg	gaggcaccag	ttgcggtgag	ctgagatat	11520
gcactccagc	ctgggcaaca	agagcaaaaac	ttcaactcaa	aaaaattaat	aaataaataa	11580
aaataaagaa	agaaaaagaaa	aaaaatgaaaa	tagtataatt	agcagaagaa	aacaccgtag	11640
aatcctcgga	ctcttaggat	ggggaatgcc	tataatataa	aaaccctgaa	gttataaaaag	11700
agaaaaatcac	ctacatacaa	accaaattctt	tctacatgcc	taaaacatag	cacaaacaca	11760
gctaaataat	catagctgaa	tgaactggga	aaacaaaact	tgactcatat	ccagacagag	11820
ttaattttcc	tacacataaa	gagtacctat	ataaacccaa	caaaaaaacc	accactaacc	11880
caaaaataaaa	atgtgacagg	taatgaacag	gtagttcaca	gagaatacaa	atggctcttc	11940
ggcacataag	atgctcagac	tgactttttac	ttattttattt	tttgagagac	agggtctcac	12000
gatgttgccc	aggttaggct	caaactcctg	ggctcaaatg	atagtaccag	gactacaggt	12060
gtgccccacc	gcactgggct	cctcaaccac	ctgtattaac	aggaaatgca	aaataaaaact	12120
ttcaaatacta	ttttacctat	tagaatggca	aaaatttgaa	aaacttcaaa	catcatcatg	12180
ttggtgagaa	tgtagaggaga	ctggcactct	catttttttgc	tgatagcata	tatatactga	12240
tggttcttat	ggaaagcaat	ctggcagcgt	ctatcaaatg	tacaagtgca	tatatccttt	12300
gacaaagcaa	ttccactcta	ggaatgtgtt	ctatatgggt	gtgcttcctg	gggctgggaa	12360
ctggggagcta	agggacaggg	gcagaagata	atctctcttt	ccctccttcc	ccgttaaaaca	12420
tggtgaattt	tatatactgt	aatatattat	ttttcacaaa	agataaattt	taagcgatat	12480
gtctgggaat	tttttttttt	cttttctgag	acagggtctc	actctgtcat	ccaggctgga	12540
atgccatggt	atgatctcag	ctgactgcag	cctcgacctc	ctgggttcaa	gcaatcctcc	12600
cacctcagcc	tcctgagtag	ctgggactac	aggcactgtc	catcatgcta	atttttgtat	12660
atacagggtc	tcactatgtt	gcccaggcta	atgtcaaaact	cctaggctca	agcaatccac	12720
ccacctcagg	ctccaaagtg	ctgggattac	aggcgtgagc	caccgcgcct	ggccctggga	12780
attctttacaa	aagaaaaaat	atctactctc	cccttctatt	aaagtcaaaa	cagagaagga	12840
aattcaacct	ataatgaaag	tagagaaggg	cctcaaccct	gagcaacaaa	cacaaaggct	12900
atctctgaga	caggaatttg	ctgaacaaa	tcgaggggaag	atgacaagaa	tcaagactca	12960
cttctcggct	gggcgcagtg	gtcacacct	gtaatcccag	cactttggga	ggccgagcgg	13020
gacagatcac	gaggtcagga	gatttgagacc	atactggcta	acacagtga	accagctctc	13080

20/122

tactaaaaat	acaaaaaatt	agccgggctg	gggtggcaggt	gcctgtagtc	ccagctactt	13140
gggaagctga	ggcaggagaa	tggcgtgaac	ccaggaagcg	gagcttgag	tgagccgaga	13200
tcacgccact	gcactccagc	ctgggtgaca	gagcaagact	ctgtctcaa	aaaaaaaaa	13260
aagactcatt	tctctagatc	ttgagccgta	ttcaaattta	tctcagctta	gtgagagggt	13320
aaagcaagga	atatccttcc	ctgtgggccc	tgctccttac	tgaaggaagg	taacggatga	13380
gtcaaggaca	ccaatggaga	aaagcactaa	caccattatc	tgatgaacat	tacgtgaaga	13440
agggtaagaa	gtgaagtggg	attgctgaag	aagtcagtg	aagcggacat	tcatttgggg	13500
aaatggaata	taggaaatcc	ataaaagtga	ttaaaaagat	gttagaggct	gaggcggggg	13560
gaccacaggg	tcaggagatc	gagaccatcc	tggttaaac	gggtgaaacc	catctctact	13620
aaaaatacaa	aaaattagcc	aggcgtgggt	gcaggcacct	gtagtcccaa	ctactcggga	13680
gactgaggca	ggagaatggc	atgaacctgg	gagacggagc	ttgcagttag	ccgagatcac	13740
gccactgcac	tccagcctgg	gtgacagagt	gagactccat	ctcaaaaaa	aaagttagat	13800
acgagagata	aagatccaac	agacacacaa	ctgctaattc	tgaacagaa	aaaacaaatg	13860
gcacaggaaa	agaaaaat	agatataaca	ccggaaaaa	ttcctgaaat	tgagtaactg	13920
aatctatagc	ttgaagggtt	ttagcatatg	ccaagaaaa	tcagtagagt	ccaaccagca	13980
caagacacat	ctagcaaggc	tggtgattct	accaacacag	agaaagaagt	gggtgaccca	14040
taatcgcgaa	aaagcgagac	catctgcagt	cttctccaga	acactggagt	ctgaagacaa	14100
aagaatgctg	cctactgagc	cagaagggtg	agaaagttag	ccaacacatc	tttaccgaat	14160
tagaatgtca	cgcattat	aaaggctgca	aaagcatgaa	aagacatgaa	agaacacaa	14220
catttacaac	atgaaagaac	acaagcattc	tcataactca	gaatccttaa	gaaaaatgta	14280
gtcctaatac	agcccactga	aatgttaaat	tacttaaatg	gctcattaat	gggaacttca	14340
tagcttcaaa	tccagtgtgt	cccactctac	aacatctctc	gcccggtctt	cctgcaatag	14400
tcagcacctt	tcctctctcc	cagtcttgct	ccctggagtc	tgctctcagc	atagcagagt	14460
gaccactgac	acacccaagt	cagagccctc	tggctgcgac	tggtctacaa	agcccttccc	14520
acccccaccc	ccacgtgccc	tccggtacct	tgtagcgtgt	ctcctgcata	ccctagcagc	14580
cctggcctcc	tcactgcccc	tcctgtacat	caggaaggcg	actccttgag	tcttggtctc	14640
ggccgctctc	tccacctgca	gtgagttaac	tcccttacct	actctagggt	attgtctcaa	14700
tgtagcagat	tcaatggggg	cctccctgac	taccctattt	aaattctaca	tactccctt	14760
gaccccatgg	acctcactca	ccctattcca	cttttattct	tacaatttag	cacttggtct	14820
cttctaactg	attctaagac	ttactcattt	attacattgt	ttgccacccc	ctctagtaca	14880
taaaactccg	aggggcaggg	atttctgtct	atttatctat	ttctttatcc	ctaggacata	14940
gaacagggga	tagttcagag	tattcaatgt	tatcaatgaa	tgaactagca	gtagtaccag	15000
ttccagttag	gcacagaatt	aaatctaaat	agaattaaat	ctcatggtct	gggttaacta	15060
tggaatgaaa	attagatata	attttaagaa	gcctagaaa	aaaaaattaa	taattgtaaaa	15120
ataatattaa	tttgataata	ataacaaaaa	ctctgcccag	cactgtggct	caaatctgca	15180
atcccagcta	ctcaggaggc	tgaggtggaa	ggatcacttg	agaccagagt	tcaagactca	15240
gcctaggcaa	cacggcagaa	aactgtctct	aaaaaaatta	aaactttaat	ttttaaaaaa	15300
gaattctcaa	agcgtcacaa	aaactggaga	tttaaggtaca	ggaagtgtga	agtaaatatta	15360
ctatgctaata	ggtttttttt	tttttttagaa	aggtataacc	aaaagatttc	tttctcaagt	15420
cgataaaactg	agaaagataa	gcatactctc	caattaacag	agggggagga	aaagccagat	15480
acaacaaaaat	aagatataaa	ttagtttcca	gttgaaaaca	agagttaggag	ttattttgca	15540
tcacctcacc	tgtgacctcc	cccagcccaa	aaaacactac	tgataaacag	ggtagaaaag	15600
catcatctca	gataaagcag	gaaaaactgc	cacagttctc	aaccacaaac	tataagcaca	15660
cacctggcca	acccctgcaa	gtctgggctc	agtaggagga	acgtgctgag	agctaggatg	15720
taccaactta	gacattctgt	gggatacaga	tgctccctga	agggtcacac	catctcaaag	15780
gcacctgtaa	tgcccactga	ttacagccac	catatgtgag	agagaaaactc	agggcactta	15840
gagagtataa	caagaacctt	atgtcatctg	agatgaggaa	tcctcagccc	tgcaaattaa	15900
ccaactcttt	agaacaactg	gcaaaacata	aatatccaca	acttttgttt	cagtaattcc	15960
actcttagat	atcaatccaa	agtacatgag	acagcagata	cacacacaaa	atggtattta	16020
ctgcagcatt	gtttataata	gcaaaaaaca	agaaataatc	catatgtctc	aataggatac	16080
tggtgtacatg	aggtgtatga	cccatcattc	aacctcaaaa	aagagtgata	tggtgttcca	16140
cagatggaga	taaaaagctg	tgtgttacgt	gaaaaacaaa	tcaagcagca	gcaggatggg	16200
cttatgatag	tcagtatgag	ctaatttctg	gaaaaaaaaa	tctagtgtgt	gcacagaaaa	16260
catctgaaag	aacagaaaca	aaactatcag	cagaatatgt	agatgtttta	ctaagtgtga	16320
tatctatact	gcttgttaatt	tttaccceaa	gcaagaatta	ctttttggaa	aaagaaaaat	16380
caggaaataa	agcattttct	taaaacttcat	gttttaacaa	atgggtgatgg	aataaaagag	16440
ttcttattca	tcataaacac	acacagcaca	catgcacgca	tgtgcgtgag	cacacccctt	16500
acttgataaa	taccatgttg	aatatttttag	ctttctcttt	taggttctat	cccttctctc	16560
aaaatgagg	tataaataaa	tgtacttttc	atgtgccttc	tgccataaac	cactttaata	16620
taactttaca	gtcccattat	cattatagtc	tcaaagctag	actcagcctg	aaactaccct	16680

21/122

ttcattttgga	acccttatta	aaatgccaca	tacagctcct	tcaaataaaa	acaaacccta	16740
ggacctgaca	ctaggcttcc	tttgttgcta	ctcataatgg	ccaagttctg	tgcttataat	16800
acatcttctt	tcattttatt	gctacatatc	caaggggttt	atatgttttt	cttattatat	16860
cttaattcaa	aacaccatca	cgctcttttc	cagatgaaaa	taaggaaaag	aaattgagca	16920
actgactgac	ttaaagggtca	taaaactata	tagtagcaga	gtcagcaaaa	gaagaaacac	16980
acatctccca	agtagaggct	gaaaaccagt	accattcacc	tccagggtga	gctatataca	17040
gattacaaaag	tcaccttctc	taaatgttca	aactgaatcc	cataccata	ctttaccact	17100
acctcgtaag	aacagcctca	gatcttggtt	tagccttttt	tttagcatgc	tgaagccaat	17160
aaaatgcttc	ccattcagca	agagaaacaa	gttctgaaac	actgaataat	ctgcccaggg	17220
cctatgaaca	tttccactgt	gagaaaatgt	ctccactgtg	tggaagaagat	ccttactctt	17280
ctccacacag	gcagaacatt	agaaaaattc	ttggattcta	tgatgcacag	cttaggagtc	17340
tggttagcac	aatttaagtc	caaatagttt	ttaaatcctc	ctctgttcca	gaaacagtgc	17400
taaatactgt	gaatataaaa	attgaaaaga	tactctcctg	gtccccaaga	aagtcagcca	17460
gatagaggag	acacaggcac	acaaatcact	gtcacatgaa	gctctacctc	cctaacttca	17520
aacgagggcc	taagtcccca	agaatacagt	agcagttgtg	actacgagta	actactataa	17580
ttcaataactt	tatctccctt	tagaaaactc	ttctcccttg	gaaatttatt	tgcatttcta	17640
aataccattc	cttactaaaa	ggaagcaggg	ctccttgggg	aaatagctga	ttctaggtgt	17700
ggactatgaa	atgaaaatgg	tgagtctggg	acatcccatg	ttgcccagaa	atcaaggaaac	17760
tgcccaagaa	ttgtacagag	catgtttaat	ggacctaaga	gtgaaccaga	aggagctcac	17820
tttgccccgc	gtggaacaat	ttcaagaaaa	acatgacagt	aatgaattat	aaaacatgaa	17880
ttaaaaataca	tattggtact	aaaaagagaa	caaaaggatg	tggttttggg	taaagctctt	17940
cttcatggaa	gaataccagc	taataaatgt	aaaggaatg	agagaattag	aaaaattatc	18000
atthttgtaa	ccttaataata	ttcacctaga	catgctaaaa	ccactgagta	aaaggctgct	18060
tggaagagg	atgctcacat	gatctcagag	tttcacacca	cagataattt	attagatata	18120
gggaaggaa	ttgtatcaag	cttctgtgta	ccccagcca	ggccccacaa	cactatgtgc	18180
ctccttgtga	tgtgggagct	acacagcatc	gccccacacag	cttctcgcca	aaactgtttg	18240
aagctaatac	caaggggaaga	actggacagc	ttctgacctt	gagacgctcc	accagacaac	18300
ttgcttggcc	tttccaaaga	aacttgcttg	gcctctccaa	agaaaactca	gtttcattta	18360
aaaacaaaac	taattatttta	aaaacaaaacg	aaaagcaagt	tgtggacttg	agctccaggg	18420
acagagcaga	catacttttc	cctgttcttc	ccagttaagt	gtaataaaaa	ccctcaacac	18480
tagataataa	acaaatataa	gaaggttctg	gaaggggaag	aggaggcaga	ctatccaggt	18540
gccttgaggg	ccacagaaca	acccagtgat	gggttctactg	gggtctcttt	ttgcttcatt	18600
atctcagact	tggaagctgaa	gcagcaggca	acttcaaaac	accaaggggc	acagattgaa	18660
aagcccaag	aaaagcctgc	cctctctagc	caaaggacca	ggaaggagac	agtctaata	18720
gatggaacac	atttagacag	taactgcccc	tttaccagca	ataactgagc	agggagccta	18780
gacttccagt	cttgtgagga	cgtaccaagg	tacccaacac	ccccaccaag	gctgagtaag	18840
gactgcgact	tttatccctg	catggcagta	gtaaggagcc	catccctcac	ccgcccagag	18900
tgtaggggga	acctggactt	ccactcccac	ccaggagtga	tgaggccctc	cctgctgggg	18960
tcatgtcaga	ggaggcctag	tgtagattca	gtgacttaac	cttttccag	agataatgag	19020
gccacttttc	ctccctcttc	ccccatgggtg	acagtgaag	cactgtggca	agcagtggc	19080
actcctaccc	ctcctagcca	gggaggtatc	agggaggcca	agtagggaa	cagaataccc	19140
acaaccaccc	agcagcaaca	gggggtcccc	acccattgg	gtgtcaatgg	aagcagagcg	19200
gaaagcctgg	atatttaccc	ccatctagaa	gtaacaagct	gatgtcccc	ttcttctact	19260
acaatgggtgt	tcaaaacagg	tttaataaag	gtctagagtc	tgataacgta	atacccaaat	19320
cggtgaagtt	ttcatttgagg	atcatttata	ccaagagtca	ggaagatccc	aaactgaaag	19380
agagaaaaaa	caattgcagc	acactagcac	taagagagca	cagatattag	aactacctga	19440
aaggatgtta	aagcacatat	cataagcctc	aacaggctgg	gcgcggtggc	tcacgcctgt	19500
aacccagca	ctttggggagg	ccgaggcagg	tggaatcaca	gatcaggaga	tcgagaccat	19560
cctggctaac	acggtgaaac	cccgctctcta	ctaaaaatc	aaaaaaaat	agcaaggcat	19620
gggtggtggg	acctgtagtc	ccagctactc	gggagcctga	ggcaggagaa	tggtcatgaac	19680
ctgggaagag	gagcagtgag	ccgagatcgc	accaccgcac	tccagcctgg	gcaacagagc	19740
aagacttcgt	cccaaaaaaa	aaaaaaaaaa	aaaaaaaagc	ctcaacaaac	aactacaaac	19800
gtgcttga	caaatgaaaa	aaaaatcttg	gcaagaaaat	aaaagatata	tattttggcc	19860
aggtgcagtg	gctcacagcc	tgtaatccct	gcaactttggg	aggctgaggc	aggcggtatca	19920
cctgaggtca	ggagtttgag	accagcctga	ccaactgga	gaaacccgt	cttactaaa	19980
aatacaaaat	tagccagtc	tggtggcaca	tgctgtaat	cctagctact	caggaggccg	20040
aggcaggaga	atcgcttgaa	ctcaggaggt	ggaggttgcg	gtgagccgag	atccccccat	20100
tgacatttgc	actccagcct	gggcaacaag	atcaaaaactc	catctcaaaa	aaatagatac	20160
atattttta	gaattgaaaa	atacagtaac	agcaagtaac	caaattgaa	ggaaagacaa	20220
catagaatgg	agggggcaga	caaaataatc	agtgaacttc	aacagaaaa	aatagaaatt	20280

22/122

acccaatatg	aagaacagaa	agaaaataga	ctggccaaaa	aataaagaag	aaaaaagagg	20340
agcagcagga	ggaatgatgg	aaaaagagaa	aggaagggaag	gaagggaagg	agggaggggaa	20400
ggagtggagg	agaaagtctc	aaagacctct	gagactaaaa	taaaagatct	aacacttgctc	20460
atcaggggtcc	aggaaaagaga	caaagatggc	acagctggaa	acgtattcaa	aaaataatag	20520
ctgaaaactt	cccaaatattg	gcaagagaca	taaacctata	gattcgaaat	gctgaacccc	20580
aaataaaaaag	cccaataaaaa	tccacaccaa	aatacatcat	agtcaaactt	ctgaaaagac	20640
gaaaaagagaa	aacgtcttga	aagcagtgag	tgaaacaaca	cttcatgtat	aaggggaaaaa	20700
caattcaagt	aacagatttc	ttacagaaat	taaggaagcc	agaaggaaat	gacacaatgg	20760
ttttcaagt	ctgaaagaaa	agaagtgtca	acacaaaatt	ctagattcag	taaaaatatc	20820
cttcaagaat	caatgggaaa	tcaagacagt	ctcagataaa	gcaaaaataag	agaatatggt	20880
gccagcagat	ctcccctaaa	ggaatggcaa	aaggaagatc	atgcaacaga	ccaaaaaatg	20940
atgaaagaag	gaatccagaa	acatcaagaa	gaaagaaata	acatagtaag	caaaaaatca	21000
tgtaattaca	ataaaatttc	tatctcctct	taagacttct	aaattatatt	gatgggtgaa	21060
gcaaaaatta	taacctgtgc	tgaagtgtct	ctactaaatg	tatgcagaga	attataaatg	21120
gggaaagtat	aggtttctat	acctcattga	agtggtaaaa	tgacaacact	gtgaaaaggt	21180
acatacacac	acacacgtaa	gtatatataa	atatatgtgt	gtatatgtgt	gtgtatatat	21240
atatatacat	ataatgtaat	acagcaacca	ctaacaacac	tatacaaaga	gataataacc	21300
aaaaacaatt	tagataaatt	gaaatggaat	tctaaaaaat	attcaaatac	tctacaggaa	21360
gacaagacaa	aaagagaggg	aaagagggag	acaaactaaa	ttttttaaaa	acataaataa	21420
aatggtagac	ttaagcccta	acttatcaat	aattacataa	atgtaaatga	tctaattata	21480
tcaattaaaa	gacagagata	gcagagttaa	tttaaaaaa	tagctataag	aaacctgtct	21540
tgggctgagt	gcagtgaact	acacttgtaa	tcccagcact	tcgggaggcc	aaggcgggtg	21600
gatcacctga	ggctcaggagt	tccagaccag	cctggacaac	atggtaatac	cccactctcta	21660
ctaaaaatcac	aaaaaaatta	gccaggcatg	gtggcacacg	cctgtagtcc	caactactca	21720
ggaggctgcy	acacaagaac	tgcttgaacc	gggcagcagc	aggtagcagt	gggccaagat	21780
tgccgacctc	cagcctgaac	gacagagtga	cagctccact	cagttgaaaa	acaaaaaaga	21840
aacctgtctt	aaatatacca	acatatgttg	gttgaaatta	aaagaataaa	atatatcatg	21900
aaaaacattt	tcaaaagaaa	ggagtggcta	tataataaac	ataaaataga	cttcagagaa	21960
aagaaaaattt	caagagacag	gaataaaaagg	atcaagaaaa	gatcctgaaa	gaaaagcagg	22020
caaatcaatc	attctgtctg	gagattcaac	accctctctt	aacaactgat	agaacaacta	22080
gacaaaaaaa	tcagcatgga	gttgagaaga	acttaacacc	actgaacaac	aggatctaat	22140
agacattttac	ggaacactct	acccaacaat	agcaaaaata	acattctttt	caagtattca	22200
ctgaacatat	ccttagaccc	taccctgggc	cataaaaaca	agctcactag	tgattgcccga	22260
aggcttggat	ggcagctgga	agagctgcat	ggggagggag	aaggtgacag	ttaaagagtg	22320
taggatttct	ttttgggata	atgaaaatgt	tccaaaattg	attgtgggtga	tgttggcgca	22380
actctacaaa	tataaaaaag	gccattgaa	tgtacgtttt	aagtggttga	aacatatggt	22440
atgtggatta	tcttaaacgc	tttttaaaaa	cttaaacacat	ttcaaagaat	agaagtcata	22500
cagagtgtgc	tctactggaa	tcaaactaga	aagaggtaac	tggaggataa	cgagaaaagc	22560
ctccaaatcac	ttgaaaactg	gacagcacat	ttctaaaatc	atccgtgggt	caaagatatt	22620
catttctgat	attcattttt	attgtttaat	gtatttttaa	aaatttctta	agggaaaataa	22680
actgactaaa	aatgaatatg	gctgggtgcy	gtggctcacg	cctgtgatcc	cagcactttg	22740
ggaggccgag	gctgggtgat	cacaagatca	ggagtccgag	accagcctgg	ccaagatggt	22800
gaaaccccgt	ctcaactaaa	aaactacaaa	aagttagccaa	gcgcagtggc	gggagcctgt	22860
ggtcccagct	acttggggag	ctgaggtagg	agaatcgctt	gaacacaggg	agcagagggt	22920
gcagtggagc	aagattgtgc	cactgcacgc	cagcctgggc	gacagagact	gcctcaaaaa	22980
aaaaaaaaaaaa	aaaaagaata	tcaaaaattg	tgggacatag	ttaaagcaat	gctgagaggg	23040
aaattttataa	cactaaatgt	ttacattaga	aaagagaaaa	agtttcaaat	caatagtctc	23100
cactcccatac	tcaagaacac	agaagatgaa	gagcaaaaata	aacccaaagc	aagcaaaaaga	23160
aagaaaaatat	aaaaataaat	cagtaaaatt	gaaaacagaa	acacaataaa	gaaaatcagt	23220
gaaacaaaagt	actgattctt	cgaaagatta	ataaaaattga	caaacctcta	gcaaggctaa	23280
caaacaaaaaa	agaaagaaga	cacggattac	cagttattag	aatgaaagca	taattagaaa	23340
caactctaca	cattataaat	ttgacaatgt	agatgaaatg	gactaattac	tgaaaaaaca	23400
caaattacca	caactcaccc	aatatgaaat	agataattgg	gatagcctga	taactactga	23460
gaaaattgaa	tttgtaattt	taacactctt	aaaacagaaa	cattaaactt	aatattttat	23520
aaatattaga	taaggtaatt	atacccttcc	ttaaacaata	aaaacgacaa	attattttgc	23580
agctaaaagag	atgtatgtac	tgtgaaaaat	atcttcagaa	aaatagaact	ttgtttgaag	23640
aataaggatt	taaaaaatgt	ttttaactct	caagaagcaa	atatctgggc	ccagatgggt	23700
ttactgaaga	attctaccaa	atgtttaatg	aagaattacc	accaactcta	catagcatct	23760
ttgagaaaaac	tgaaagagaag	ggaacatctc	caggttcatt	ttatgaagtg	ggtgttactc	23820
tgatactaga	actgtataag	gacagctact	cttgacacac	tgcctatggg	tagctctgct	23880

23/122

ctgcaggaac	agtcagaaaa	aaaaaaaaaa	gaagcactgg	acaaggggcag	tataaaaaaa	23940
gaaaactggg	ccaggtgcag	tggtcacac	ctgtaatctc	agcactttgg	gaggctgacg	24000
ctgggtggatc	acctgagggtc	aggagtttga	gactagcctg	gccaacatgg	taaaaccctg	24060
tctctactaa	aatacaaaaa	ttagccaggc	aggggtgggtg	ggaaaaataaa	aaggaaaaaa	24120
aaacaaaaat	aaactgcaga	ccaatatcct	tcatgagtat	agacacaaaa	ctccttaaac	24180
tccttaacaa	aatathtagca	agtagaagca	atatataaaa	ataattatac	accatgatca	24240
agtgggactt	attccagaaa	cgcaagctcg	gttcaacatt	tgaaaaacaag	gtaaccact	24300
atatgaacgt	actaaagagg	aaaactacat	aatcacatca	atcaatgcag	aaaaaagcat	24360
ttgccaaaat	ccaatatcca	ttcatgatac	tctaataaga	aaaataagaa	taaaggggaa	24420
attccttgac	ttgataaagc	ttacaaaaga	ctacaaaagc	ttacagctaa	cctatactta	24480
atggtgaaaa	actaaatgct	ttccctacg	atcaggaaca	aagcaaggat	gttcactctc	24540
attgctctta	tttaacatag	ccctgaagtt	ctaactttgt	caaaacgata	agaaagggaa	24600
atgaaagacc	tgagatttgg	caaagaagaa	ataaaactgt	tctgttttgc	agatgacatg	24660
attgtctcat	agaaaaatgta	aagcaactag	gggtaggggg	gcagtgaggag	cacgctgggtc	24720
aaaggatacc	aaatttcagt	taggaggagt	aagttcaaga	tacctattgc	acaacatggt	24780
aactatactt	aatatattgt	attcttgaaa	actactaaa	agtgggtgtt	aagcgttctc	24840
accacaaaaa	tgataactat	gtgaagtaat	gcatacgtta	attagcacia	cgtatattac	24900
tccaaaacat	catgttgtac	atgataaata	cacacaattt	tatctgtcag	tttaaaaaa	24960
catgattttg	gccaggcaca	gtggctcata	ctgttaatcc	cagcatttta	ggaggctgag	25020
gcgagcagaa	aacttgaggt	cgggagtttg	agaccagaat	ggtcaacata	gtgaaatccc	25080
gtctccacta	ataatacaaa	aatttagcagg	atgtggtggc	gtgcacctgt	agaccagct	25140
acttgggagg	ctgaggcacg	agaattgctt	gaacaaggga	ggcagaggtt	gcagtgcgct	25200
gggtgccaat	gcattccagc	ctggtgacag	agtgagactc	catctcaaaa	aaaataaaat	25260
aaagcatgac	ttttcttaaa	tgcaaaagcag	ccaagcgcag	tggtctatgc	ctgtaatccc	25320
accactttgg	gaggccgagg	caggcagatc	acaaggtcag	gagtttgaga	ccagcctgac	25380
caacatggtg	aaaccccatc	tctactaaaa	aataataaaa	ttagccaggc	atgtgtagtc	25440
tcagctactc	aggaggctga	ggcaggagaa	tcacttgaac	ccggaggcag	aggttgcagt	25500
gttgagccac	cgcactccag	cctgggtgag	agaacgagac	tccgtctcaa	aaaaaaaag	25560
caaaaataacc	taattttaaa	aaacttaaaa	ctactaagtg	aattcagtaa	gtcttttagga	25620
ttcaggatat	atgatgaaca	tacaaaaatc	aattgagctg	gacaaaaggag	gattgtttta	25680
ggtcagtagt	ttgaggctgt	aatgcacaat	gattgtgcct	gtgaatagct	gctgtgctcc	25740
agcctgagca	gcataatgag	accacatctc	tatttataaaa	aaaaaaaatt	gtatctctat	25800
gtactgacaa	taagcacatg	ggtactaaaa	ttaaaaacat	aataaatact	gttttttaatt	25860
gcctgaaaaa	aatgaaatc	ttacataata	atgttaacaaa	atgtgcaggag	cttgtgtgct	25920
gaaaactaca	aaacgctgat	aaaagaaatc	aaagaagact	taaatagcgt	gaaatatacc	25980
atgcttatag	gttggaaaaac	ttaatatagt	aaagatgcca	attttatcca	aattattaca	26040
caggataaca	ttattactac	caaaatccca	gaaaaatttt	acatagatat	agacaagatc	26100
atacaaaaaa	gtatacggaa	atatgcaaa	gaactagagt	agctaaaaa	aatttgaaaa	26160
agaaaaataa	agtgggaaga	atcagttctat	ccagtttcaa	gacttacata	gctacagtaa	26220
tcaagactgt	gatattgaca	gagggacagc	tatagatcaa	tgcaaccaaa	tagagaacta	26280
agaaaagaagc	acacacaaat	atgcccacaa	gatttctgac	aaagggtgta	aaacacttca	26340
acggggggaag	atatgtctct	cattaaaggg	tgtagagtca	ttgcacatct	ataggcaaaa	26400
agatgaacct	gaacctcaca	ccctacagaa	aaattaaact	aaaatgactc	aaggactaaa	26460
cataagatat	acatctataa	aacattttaga	aaaaggccac	gcacggtggc	tcacgctcgt	26520
aatcccagca	ctttggggagg	ccaaggcagg	tggatcacct	aaggctcagg	gtttgagacc	26580
agccggtatc	ctgtgaatcc	gcccacatct	tactaaaaat	acaaaattag	ctggacgtgg	26640
tgccacatgc	ctgtaatccc	agctacttgg	gaggctgagg	catgagaatc	gcttgaaccc	26700
gggggggcaga	ggttgccggtg	agccaagatc	acaccattgc	actccagcct	gggcaacaag	26760
agcaaaaactc	caactcaaaa	aaaaaaaaaa	aaagaaaaaa	tagaaaaatct	ttgggatgta	26820
aggcgaggta	aagaattctt	acacttgatg	ccaaaactaag	atctataagg	ccagtctgtg	26880
tggtctcatgc	ctgttaattcc	agcactttgg	tcaactagat	gaaagggtata	tgggaattca	26940
ctgtattatt	ctttcaactt	ttctgtaggt	tgcacatttt	tttagtaaaa	aattggggga	27000
aagacctgac	gcagttggctc	acacctgtaa	tcccagcact	ttgggaggcc	ggggcagggtg	27060
gatcacacgg	tcaggagttc	gagaccagcc	tggccaacat	ggtgaaaccc	cgtctctacc	27120
aaaaatataa	aaaattagcc	gggtgtcatg	gtgcatgcct	gtaatcccag	ctactgagga	27180
ggctgaggca	tgagaatcac	ttgaacctgg	gaggtgggaag	ttgcagtgag	ccgagattgt	27240
gccactgcac	tcagcccttg	ggtgacagag	cgagactccg	tctcaaaaga	aaaaaaaaaa	27300
aaagaatatc	aaacgcttac	tttagaaact	attttaaagga	gccagaattt	aattgtatta	27360
gtatttagag	caatttttat	gtctccatggc	attgttaaat	agagcaacca	gctaacaatt	27420
agtggagttc	aacagctggt	aaatttgcta	actgttttagg	aagagagccc	tatcaatatac	27480

24/122

actgtcattt	gaggctgaca	ataagcacac	ccaaagctgt	acctccttga	ggagcaacat	27540
aaggggttta	accctgttag	ggtgttaatg	gtttggatat	ggtttgtttg	gccccaccga	27600
gtctcatgtt	gaaatttggt	ccccagtact	ggaggtgggg	ccttattgga	aggtgtctga	27660
gtcatggggg	tggcatatcc	ctcctgaatg	gtttggtgcc	attccttgca	gaatgagtga	27720
gttcttactc	ttagttccca	caacaactgg	ttattaaaaa	cagcctggca	ctttccccc	27780
tctctcgctt	cctctctcac	catgtgatct	cactgggtcc	ccttcccttt	atgcaatgag	27840
tggaagcagc	ctgaagccct	cgccagaagc	agatagtgat	gccatgcttc	ttgtacagcc	27900
tacaaaacca	tgagcccaat	aaaccttttt	tctttataaa	ttatccagcc	tcaggtattc	27960
ctttatagca	agacaaatga	accaagacag	ggggaaatca	acttcattaa	aataatctat	28020
gcagtcacta	aacaaataag	aacaagaggc	tccagaagtg	ggaagccaat	accagaggtt	28080
cctacaatac	agtatctgaa	aagtcagtt	tccaaccaa	aaatatatat	atacaggccg	28140
gacatggtag	cttatgtctg	taatcccagc	actttgggat	gctgaggcgg	gcagatcacc	28200
ctaggtcagg	agttcgagac	cagcctggcc	aatatggcaa	aacccgctct	ctactaaaa	28260
tacaaaaatt	agccaggcat	ggtggtggat	gcctgtaatc	ccagctactc	gggaggctga	28320
ggcaggggaat	cacttgaacc	caggaggcag	aggttgcaat	gagccgagat	cacgccactg	28380
aactccagcc	tgggcaacaa	agtgaagact	cagctcaaaa	aaaaaaaaaa	tatacatata	28440
tatatgtgtg	tgtgtgtgtg	tgcgcgctg	tctgtatata	cacatacaca	tatacatata	28500
tatacagaca	cacatatata	tatgaagcat	gaaaagaaac	aaggaagtat	gaaccatact	28560
ttctgtgggt	atgataggat	ggggtatcac	gggggaagta	gacaaggga	actgcaagtg	28620
agagcaaaaca	gttatcagat	ttaacagaaa	aagactttgg	agtaaccatt	ataaatatgt	28680
ccacagaatt	aaagaaaagc	gtgattaaaa	aaggaaagga	aagtatcata	acaatattac	28740
tccaaataga	gaatatcaat	aaaggcatag	aaattataaa	atataatata	atggaaattc	28800
cggagttgaa	aggtcagaata	actaaaattt	aaaattcact	agagaagggt	caacactata	28860
tttgaactgg	cagaagaaaa	atttagtgag	acaaatatac	ttcaatagac	attattcaaa	28920
tgaaaaataa	aaagaaaaaa	gaatgaagaa	aaataaacag	aatctcagca	aatgtgggca	28980
caccattaat	cacatttaaca	tatgcatact	gagagtaccg	gaagcagatg	agaaagagga	29040
agaaaaataa	ttcaaatgat	ggccagtaac	ttcctagatt	tttgttttaa	agcaataacc	29100
tatacaatca	agaaactcaa	tgaattccaa	gtaggataaa	tacaaaaaga	accacaacc	29160
gatacaccat	ggtaaaaaatg	ctgtaagtca	aaaacagaga	aaatattgaa	agcagctaga	29220
ggaaaaactta	taagagaacc	tcacttacaa	aagaacatca	cttataaaag	aaccacaata	29280
atagaaacag	ttgacctctc	atcagaaaaa	atgaattgata	acatatattga	agtgctcaaa	29340
tatgtataca	caatgggaatt	atatacgaca	aagctgtctt	tcaaaaaatat	acatccaaaa	29400
ggattgaaac	cagggtcttg	aagagttatt	tgtacatcca	tgttcatagc	agcattatcc	29460
acaatagcca	aaaggtagaa	gcaacccaag	ggtccatcga	caaataaata	aaatgtggta	29520
tatgtataca	caatgggaatt	tattcagtat	taaaaaggaa	tgaatttctg	acacatgcta	29580
caacatggct	aaaccttgag	aacactatgc	taagtgaat	aagccagcca	caaaaaggaca	29640
ataaccatat	tacttcactt	gtatgaaata	cctagggtag	tcaaatcag	agatagaaag	29700
taaaacagtg	gttgccaagg	gctgagggag	ggagtaacgt	ggagttattg	ttgaatgggt	29760
acagaatttc	agttttgcaa	gataaaaaaga	gttctggaga	cagatggtgg	tgagggtggg	29820
acaacaatct	aaatatactt	tatactactg	tatactactg	ttaaaaatga	ttaacatggg	29880
gaaaccccg	ctctactaaa	aatacaaaaa	aattagctgg	gtgtggtggc	gggcacctgt	29940
aatcccagct	acttggggag	ctgaggcagc	agaattgctt	gaaaccagaa	ggcggagggt	30000
gcagtgaact	gagattgcgc	caccgcactc	tagcctgggc	aataagagca	aaactccgtc	30060
tcaaaaaata	aaaaataaaa	aaaattttaa	aatgattaa	caggaggcca	ggcacgggtg	30120
ctcacacctta	taatgccagc	actttgggag	gccgaggcag	gcgatcactt	gagaccagga	30180
gtttgagacc	agcctggcca	acatggcaaa	accctgtctc	tgctaaaaat	acaaaaatta	30240
gccaggcatg	gtggcatata	cttataatcc	cagctactgg	tgagactgag	acacgagaat	30300
tgcttgaacc	caggaggcag	agattgcagt	gagtcgagat	cgcgccactg	aattccagcc	30360
tgggcgacag	agcaagattc	tgctctcgaa	aaacaaaaac	aaaaacaaaa	agcaaaaacca	30420
aaaaataaatt	aagcaggaaa	cgagattgct	gctgaggagg	agaaaagatg	gcaggaccaa	30480
ggctcatgag	agcacaacaa	ttttcaaaaa	atgttttaag	attaaaaatg	taaaattttat	30540
atgtatctta	ccacaaaaaa	aagggctggg	gggcaggaaa	tgaaggtgaa	ataaagacat	30600
cccagagaaa	caaaagtaga	gaatttgttg	ccttagaaga	aacaccacag	gaagtctctc	30660
aggctgaaaa	caagtgaacc	cagagggtta	tctgaattct	cacagaaaaa	tgaagcatag	30720
cagtaagggt	tattctgttaa	ctatgacact	aacaatgcac	atttttctct	ttcttctctg	30780
aaatgattta	aaaaagcaatt	gcataaaata	ttatatataa	agcctattgt	tgaacctata	30840
acatatatag	aaatataactt	gtaatatatt	tgcaaataac	tgacacaaaag	agagtgggaa	30900
caaagctgtg	actaggctaa	agaaattact	acagatagta	aagtaatatata	acagggaact	30960
taaaaataaaa	attttaaaaa	atttataaaa	acaataatat	ggttgggttt	31020	
gtaattattaa	tagacataat	acaaaaatca	cacaaaaagg	gaagaagaca	atagaactac	31080

25/122

ataggaataa	catttttggt	tctaactaga	attaaattat	aaatatgaag	tatatctctg	31140
taagttaaga	cacacatgtt	aaaccctaga	tactaaaaag	taactcacat	aaatacagta	31200
aaaaataaaa	taaaataatt	aaaatgtttg	tattagtttc	ctcagggtac	agtaacaaac	31260
taccacaaat	tgagtggctt	aacacaactt	aaatgtattt	tctcccagtt	ctggaggcta	31320
aacacctgca	atcaaggtga	gtacagggcc	atgctccctg	tgaaggctct	aggaaagaat	31380
cctcccttgt	ctcttccagc	ttccagtggg	tctcagtaac	cctaagtgct	ccttggcttg	31440
tagctatatc	attcctagca	accgaaaaga	agaaaataat	aaagattatg	gcaaaaaata	31500
atgaaatcaa	aaggagaaaa	atggaaaaaa	ataaataaaa	ccaaaagcta	gttctttgaa	31560
aagatcaacc	aagttaacaa	accttttaac	tagactgaca	aaaaggaggt	aagactcaaa	31620
ttactagaat	cagaaataaa	agaggggaca	ttactaatga	gggattagaa	aagaatacta	31680
cgaacaaatg	tgtgccaaca	aattagaaaa	cttagatgaa	atggacaggt	tcctaggaca	31740
acatcaacta	ccaaaattta	ctcaagaaga	aagagacaat	ttgaatgagc	tataacaagg	31800
gaagagactg	aattgacaac	caagaaacta	tccacaaaaga	aaatcccagg	cccagaagat	31860
ttcactgtga	aattctttca	aacttataaa	tataaattaa	catcagttct	tcacaaactc	31920
ctccaaaaaa	aagaacagat	ctctatttac	aggcgatacg	atcttttagaa	aatcctaagg	31980
gaactactaa	gaactatgta	taactgataa	acaagttcag	caaggctgca	ggatagaaaa	32040
ccaatatata	aaaatctatt	atattttctat	acacttgcag	tgaacaaccc	aaaaatgaga	32100
ttaagaaaat	aattcaattt	acaataacat	caaaaagaat	aaaaacactc	aaaaataaat	32160
ttattcaagt	aagtgcaaaa	cttatactct	agaagctaca	aaacactgtt	aaaagaaatt	32220
aaagggtttac	ataaatgaaa	aactatccca	tgttcatgga	tcaaaagact	tattactggc	32280
aatgctctcc	aaattgatct	ataaattcaa	caaaatcctt	atcaaaatcc	cagatgaggc	32340
tgggggtggc	ggttcatgcc	tgtaatccca	gcactttggg	aggctgaggc	acgcagatta	32400
cctgaggtcg	ggagctcgag	atcagcctga	ccaacatgga	gaaaccctat	ctcttctaaa	32460
aatacaaaat	tagtcagggc	tggtgggcaca	tgccataaat	cccagctact	cgggaagctg	32520
aggcaggaga	atcgcttgaa	cccaggaggc	agaggttgca	gtgagccaag	atcgtgccat	32580
tgcactccag	cctgggcaac	aagagcaaaa	ttccatctca	aaaaaaaaaa	aaaaaaaaatc	32640
ccagatgact	tcactgttga	aattgaaaag	attattctaa	aattcacatg	gaattgcaag	32700
accttgagaa	tagccaaaaa	aaacttgaaa	aacacgaaca	aaatatagga	tgactcactt	32760
gccaattgca	aatgtttacga	cacagcaaca	gtaatcaaga	ctgtgtggta	ctggcaaaag	32820
acatacatat	acatacatat	caatggaata	taattgagag	tacagaaaca	agcctaataa	32880
tcatatgtaa	gtgcttttct	atttttttct	ttttttttct	ctttttttgta	gagatagaat	32940
ctcaccatgt	tgcccagget	ggtcttcaac	ttctgggctc	aagcaatcct	cccactgtgg	33000
cctcccaaa	tgctgggata	actggcatga	gccaccacat	ccagcccaga	tgattttcaa	33060
aaaagtcaac	aagcctattc	ttttcaacaa	ataggctctg	gatgatcaga	tagtcacatg	33120
aaaaaaaaaa	tgaagtggga	ccctccatca	cactaaagtg	ctgcgattat	aggcatcagc	33180
caccacatcc	agcccaaatg	attttcaaaa	agggtcaacaa	gaccattctt	ttcaacaaat	33240
aggctctggg	taatcagata	gtcacatgaa	aaaaaaaatg	aagttggacc	ctccatcaca	33300
ccatatgcaa	aaattaatc	aaaaatgaat	tgatgactta	aacgtaagag	ttacgactgt	33360
aaaactctta	gaaggaaaca	tacgggtaaa	tcttaaagac	gttaggtttg	acaaaagaat	33420
cttagacatg	acaccaaaag	catgaccaac	taaggtaaaa	tagggtaaat	tgtacctacc	33480
aaaatgaaaa	acctttgtgc	tggaaggac	accatcaaga	aatggaaagc	caaaatagcc	33540
aaggcaatat	taagcaaaaa	gaacaaagct	ggaggcatca	tactacctga	cttcaaaagc	33600
acagtaacca	aaacagcatg	gtactagtga	aaaaacagac	acatagacca	atggaacaga	33660
ataaagaacc	caaaaataaa	tccacatatt	tatagtcaac	tgatttttga	caatgacacc	33720
ccttcaataa	atgatactag	gaaaactgga	tatcgatatg	cagaagaata	aaactagacc	33780
cctatctctc	accatataga	aaaatcaact	cagactgaa	taaagacttg	aatgtaagac	33840
ccaaaactat	aaaactactg	gtagaaaaca	taaggaaaaa	cgcttcagga	cattgggtcca	33900
ggcaaaagat	ttatggctaa	aaactcaaaa	acacaggcaa	caaaaacaaa	aatggaaaaa	33960
tagcacttta	ttaaaactaa	aagctcctgc	acagcaaaag	aaacaacaga	atgaaaagac	34020
aacctgtaga	atggggagaaa	atatttgcaa	actatccatc	catcaaggga	ctagtatcca	34080
gaacacacaa	gtgactaaaa	caactcaaca	gcaaaaaagc	aaataatctg	gtttttatat	34140
ggcacaaga	tctgaataaa	cattctcaaa	ggaagacata	caaatgtcac	tatcattctg	34200
ccagtaccac	actgtcttga	ttacttgtta	gtgtataaat	ttttaaattg	ggaagtgtga	34260
gtcatcctac	actttgttct	tgtttttcaa	gtttgttttg	gctattctgg	gagccttgca	34320
agtataaaat	agccaaacaag	tatgaaaaaa	tgctcaccat	cactaatcat	cagagaaata	34380
aaaatcaaga	ccactatgag	atatcctctc	actccagtta	gaatggctac	tatcaaaaag	34440
acaaaatata	atggatgctg	gcaaagattt	ggagaaaagg	gaactcctat	acactgtggg	34500
tagggatgca	aattggtaat	ggccattatg	gaaaataata	ctgaggtttt	tcaaaaaact	34560
gaaaatagaa	ctaccatgat	atccagcaac	cctactactg	ggtatttatc	caaaggaaag	34620
aagttagtat	actgaagaaa	tatatgcact	ctcatgttaa	ttgcaacact	gttcacaaca	34680

26/122

gccaaagacag	ggaataaatc	taaatgtgca	tcaacagatg	aatggataaa	gaaaatgtgg	34740
catatacact	caatagaata	ctattcagcc	attaaagaag	aatgaaatcc	tgtcatccca	34800
gcaacatgga	tgaacctgga	ggacattata	tttaatgaaa	taagtaaagc	acaaaaagat	34860
aaacagtaca	tgttctcact	cagacatggg	tgctaaaaag	aaaatggggg	cacagaatta	34920
gaagggggagg	cttgggaaaa	gttaatggat	aaaaatttac	agctatgtaa	gaagaataag	34980
tttttagtgtt	ctatagaact	gtagggcgag	tatagttacc	aataacttat	tgtacatggt	35040
caaaaagcta	gaagagattt	tggatgttcc	cagcacaaaag	gaatgataaa	tgttttgtgat	35100
gatggatatic	ctaattaccc	tgattcaatc	attacacatt	gcatacatgt	atcaaatat	35160
cactctgtac	ctcataaata	tgtataatta	ttacgtcaac	aaaaaaaagg	aaaaaaaagaa	35220
aattaagaca	acccacataa	tggaagaaat	aaaatatctg	caaatttat	atatctgata	35280
aatattttaat	attttataata	tataaagaac	tcctacaact	caagaacaac	aacaaaacaa	35340
cccaattcaa	aaatgggtaa	aagccttgaa	tatacactta	tctaaagact	atatacaatt	35400
ggccaataaaa	gacacgaaaa	gatgctcaac	atcactagtc	atcagggaaa	tataaatcaa	35460
aaccacaatg	tagaatgtag	acaccacttc	atatgcacta	ggatggctag	aataaaaaagg	35520
taataacaaa	tgttggtaag	gatgtgaaaa	aatcagaaac	ctcattcgct	gctgttgagg	35580
atgtaaaagt	gttcagccac	tttggaatac	agtctggcag	ctcctcaaat	tattaaatac	35640
agagttaccg	tatgaccacg	gaatattcct	cctgggtcta	taacccaaaa	aatgaaaaca	35700
tatatccaca	taaaaaactg	tacatgggca	tttatagcaa	cattattcat	aacagcaaa	35760
tggttaagaa	cccatatgcc	catcatctga	tgaaacaggt	aataacatgc	ggtattatcc	35820
atacactaga	atattatctg	cccatacaag	gagtgcacac	cagctacatg	ctacaaggat	35880
gaatctcgga	aaccttatgc	taagtgaag	aagccagtc	caaataacca	cagattatga	35940
ttccatgcat	cggaaatgac	cagaataggg	aaatctatag	agacagaaag	tagatttagt	36000
gttgggtggg	gctgggagga	caggtagtag	actactttcc	cagaactact	ggaacaaagt	36060
accacaaact	ggggagctta	aacatagaaa	ttgatttcct	cacagttctg	gagactagga	36120
ctctgagatc	aaggtgtcag	cagagctggg	tccttctgag	ggccctgagg	caaggctctg	36180
tcccaggcct	ctctccttgg	ctggcagggt	gccatcttct	ccctgcgtct	tcacatcatc	36240
ttttctctgt	gtgtgcccc	gtccaaaatt	tgattggctc	attctgggtc	atggccaatt	36300
gctatgcaca	aagtgaagtc	tacttccaaa	agaagggaa	agggaaacact	gactaggcta	36360
aacttatagt	cattttaatg	tcgcgttttc	ctatgagatt	gtgaacacac	agaagtaggg	36420
tttttatcta	cattgtgcaa	agtttaataa	gaaaaatag	attcaagaga	agcagttcaa	36480
tagcaggaa	ttaatatggg	aactaattac	aaggtttagg	gcaggactaa	aaagccagtt	36540
gggatggtga	gccaaaccag	agattagcaa	cagtgaggac	ccatctacct	accacccatg	36600
aagctggaag	gataaaggag	gggctattat	cagagtcac	aagccagttg	cagagtcctt	36660
ggctggagct	gggaccaccc	tagagacact	gtgcaaaag	gaaaacacagg	gggaaaaaac	36720
ctgacttctc	ccttctctcc	acctttcaat	ctcccactag	tgcttctctac	tagccatact	36780
tggccagaga	cagtgacaag	gaacactgca	aaatgaagtt	tgtaggaatc	atctccctct	36840
gagacagaga	aatatgggaag	ggtagaaaa	gaatcagagg	ataaaagagaa	aaaaccctga	36900
gtactatctt	atttatcttt	gtatctccag	tgctaatact	gtctctcaaa	aaaggaaagc	36960
aattgagaga	aactgaaaac	tccaattgaa	atgaaagaat	ggagaattac	tggactagaa	37020
gagaagagaa	aaatttatcc	cgcatagagt	aaacaagaat	ggattcacia	aggacgtgat	37080
gaatgaaaag	ctataatcag	caaagatttg	ccagagaaat	taaaaagtgg	taaactcagc	37140
cacgctgtac	aacctgaagg	cacaatgcat	gaaaacgttt	caagaaatga	caagatttga	37200
agtcacaaat	taagtgtctt	tccagaatct	ctcaagacga	ttatatagct	accccatttt	37260
attaaataaa	atggaaactt	actaaacttt	ccccttgat	taaactaaca	tatgtcctaa	37320
tagcaaacga	ttctggaatt	cctagagtaa	aatatatatt	gtcaaatgtg	attgtctctt	37380
taatatctct	ctgacctcct	tttgctattt	aggatatttg	tatacacatc	acacgtaaat	37440
ttgggtctata	gtttacatct	acgggcttat	actgttcttt	ttttcatttt	tttaaaattt	37500
ccaaccccca	gtatccatat	actgctctct	atcagggtta	ttttaacttt	gtaaaaatcag	37560
ctgagatgct	ttccatgttt	ttttttttta	ttttctgcca	catttgataa	gcataggagt	37620
taccaccatc	aaccttggat	tatttaagca	ttcacgatcc	cacgtgtgga	ttttttattc	37680
agagctcttc	ttgtcattcc	tgctatcagc	acagaaccca	atctcagctt	tccagctata	37740
ctctcaccoc	atggaaattg	cagatgaagt	tcaaaaaggac	ctttgcatta	tcctgcctcg	37800
ccctcttccc	ccttcattta	gacatcacct	tcttctagaa	cgtcttacct	gacatgccct	37860
gctcccaacc	cctgctgccc	aatttgtgtgc	tctcccgtgt	cctggcctgc	catctctctt	37920
agtaattgcc	tgtctccctc	tctgtctccc	cacccagaca	ttaagctgaa	tagactggat	37980
ttgtgtcttg	tccatcacta	taatctcagc	acctagtacc	tagtaggtac	ttaccatgta	38040
ttcattagca	aaatgtttat	tataaccttg	caccttaaaa	acaagagaag	gaagacaaaa	38100
ttaagtctta	agactatgg	ttagaacatg	gatcagaaa	tacagtctgc	agcccaaatc	38160
cagaccaa	gaagagacca	tgttcattta	catacaacct	atagcagctt	tcacactaca	38220
ggagcagagc	taagtagttc	caagggaaca	cacggccctg	caaagcctaa	aatattttact	38280

27/122

ctatagctct	tcacagaaaa	agttttcaga	tcctctcgttt	agaactcttg	ttcatatgca	38340
atttcactaa	accatagttt	tttgggtttg	tttgggtttt	tttggcaaaa	aggaatgagc	38400
cgatccagaa	aaggttgaaa	agaatgaatc	attactgctg	aaagaatgtg	cacacagtcc	38460
gtcagtatcc	tgctgccatg	ctgacaccca	tccaatagtg	tcatgagatg	cagcagctac	38520
tactgtgttc	tcaatgccga	gtccacccac	tccataacca	tgccaagca	atcttgggaa	38580
catcatcacc	atgcttggtt	atccttaagg	tattgcctca	catacagcag	tggtctggtca	38640
taaaagtcaaa	tgacactagt	ggccaggagg	tcaagagaat	gagtgaggac	aggtgggtag	38700
gcagcccagg	ccctagcaac	agcaggagct	cacccctcag	tcactctagc	caggactgaa	38760
atacttttca	ccctttcaag	agagactagg	aatctggatt	tttatgtgaa	atatcttgat	38820
tactaaatgt	tgtaaacaga	catgtcaaaa	ggtaaaaacta	agtaagttca	tggggcgat	38880
tgactattca	ggttatagaa	ttaaggattc	ttatccaaca	cagataccaa	ccaaaaagct	38940
gacgtataac	atattaggag	aaactatgtg	cactgtcgaa	acatcaacaa	ggggctaatg	39000
tctaaaatag	tctatattgg	attccagttg	aaacatgggg	aaaggacatg	aacaggcaac	39060
ttatgtcaat	ggaaactcaa	aaagataaca	agcatatata	aaagcattct	caaattcagt	39120
agtaaacaga	cagatgcaaa	taaaaagagg	gaaactgctg	ccgggcacag	tggtctcacac	39180
ctgtataccc	agcattttgg	gaggccgagg	cgggcggatc	atgaagtcat	gagatcgaga	39240
ccatcctggc	taacatggtg	aaaccccgctc	tctactgaaa	acacaaaaaa	ttagccaggc	39300
gtagtgggtg	gcaccagtag	tcccagctac	tcaggagggtt	gaggcaggag	aatggcatga	39360
accaggagg	cggagattgc	agtgagccga	gaacctgcca	ctgcactcca	gcctgggcga	39420
ctgagtgaat	ctccatctca	aaaaatataa	taataattat	aattataata	ataataaata	39480
gtaaaataat	aaaaagagag	agactgctaa	agtctagaaa	ggtgaatgat	gccaagcgca	39540
tgaacaagatc	agggccttgg	gatggccggg	gtcagtggct	cacgcctgta	atcccaccac	39600
tttggggaggc	caaggcgggg	ggatcatgag	gtcaagagat	caagaccatc	ctggccgaca	39660
cagtgaaacc	cggtctctac	taaaagtaca	aaaaaatata	tatatatata	tatatatta	39720
tattatatat	atatatatca	gagccttggg	aatccttgtg	tgctgctggg	gaaggtagt	39780
gtgcagccac	ccttgacagc	aatctggcag	tacttgggtt	tattaagtat	aggcacacac	39840
cacgaccagg	cagtcctact	cctgggtcta	aatcccaaa	aattctcaca	caagtccata	39900
aggagacatg	tacgagcttc	attcagcatt	actgggagtg	ggaatcaacc	tgggtgtcca	39960
tctacaggag	acgagatgga	caaaatgtgg	tggatattaa	gaccagaatc	accaagtaac	40020
agagatgggt	ggtgagtgac	aatcctaaga	tacagaataa	aggctagaac	atgatgccat	40080
tcatgtaaat	taaaaataga	tgcacacaaa	cgagtatacg	cgtgaccctt	gaatagcaca	40140
ggtttgaact	gcctgtgtcc	acttacatgt	ggattttctt	ccacttctgc	tacccccaag	40200
acagcaagac	caacccctct	tcttctctct	ccccctcagc	ctactcaaca	tgaagatgac	40260
aaggatgaag	acttttatga	taatccaatt	ccaaggaact	aatgaaaagt	atattttctc	40320
ttccttatga	ttttctttat	ctctagctta	cattatttcta	agaatatggt	acataataca	40380
catcacacgc	aaaaataaat	ttaattgact	gttttatatta	tgggtaaagg	ttccactcaa	40440
cagttaggct	tcagtagtta	agttttggga	gtcaaaaagt	atacacagat	tttcaactgt	40500
gcaggcaatc	agttcccttg	acccctcat	tggttcacggg	tcaactgtat	atacacaaaa	40560
gtatttatatg	aacctcatta	gaatagctgt	ctatagggag	aagagaatga	gagtgaggata	40620
aaacggaatg	aacaaaataaa	ccaacaaatg	catttaacaag	caaaacaaca	gaggggcttg	40680
catgggccag	tgatgataaa	gggctaagaa	tgagaatata	attaattcaa	ttcctcacac	40740
ctgagggtcta	aaaccaagga	aagggagggg	caggcgtgga	ggctcacgcc	tgtaatccca	40800
gcactttggg	aggctgaggc	gggctgagtc	caagattagg	agtttgagat	cagcctggcc	40860
aacacagtga	aagcccatct	ctacaaaaaa	tacaagaatt	acccagggtg	ggtggcacat	40920
gcctgtagtt	agctactctg	gaggctgagg	caggagaatc	acttgaaccc	aggaggcgga	40980
ggttgccagg	agccgagatc	acaccattgc	actccagcct	gggtgacaga	gtaagactct	41040
gtctcaaaaa	aataaaaaaa	ataaaaaaac	agagaaaagg	aggaaactag	atccaggctg	41100
actagataca	gccttttagag	ttagaaaaa	tgatttgaca	atctaagccc	acactcagat	41160
tgaatgaaat	tgaaaagcct	ttcaaaactaa	aacattttaa	tacaccatct	gctgcagaca	41220
gaactcagac	aactcaaaaa	ggtaatgtca	gcgtggtggt	ttatatcacc	accctcaaca	41280
cagaataaaaa	atcagctgca	tgtgaagcag	tgactagaat	gaagaaaagg	ctgcttctta	41340
cttcttctta	gtgggttctt	ccgaaaacat	taataggcac	cagctctatg	catgtcacc	41400
tgaggggaga	catgggggtat	ataactatga	cttactgttc	attcctcaag	gaattcccaa	41460
tcttgtggaa	gattatacac	aatgaggcaa	caaaaactat	ccaataaaac	cacggaaaag	41520
aagccagtga	caagaagacc	atgtagtga	ggccctgtga	gcagagctga	tggccatttg	41580
gggaagaag	accaacatgg	atgggggtga	tcagggtggc	tccgtgggaa	agctgggaaga	41640
gaagtggcag	atctctgagc	tggatgatgg	gccactacca	tctgtatatg	gctaattaaa	41700
gaccattgtg	ggatttttta	ttcagctctt	ctcgtgcatt	cctgctatca	gcacagaacc	41760
caatctcaac	tttccagcta	tattgagcta	aactctcac	ctcatggaat	ttgcagataa	41820
agttcaaaaag	gattcctgccc	ttttcaaaat	aattttgaat	ggttgagtag	tcctctctgtg	41880

28/122

ctctctcact	gacaccctct	caagcgtgct	gagcacgtgc	catgctatgg	ctttctccaa	41940
catcaggaaa	tggtctccac	tcagtttcac	cttaatacaa	atgtgtttct	tcttcagaga	42000
aggcaaaaa	attcatgacc	atctgactgg	gagaagtcac	ttctaggtaa	agtgtccatc	42060
ttttctcgag	gaacacagga	ggaaaatctt	acagaaaaga	gttaacacag	caggcctaag	42120
actgcttttt	aaaataaata	aataaataaa	taaataaata	aataaataaa	taaataaata	42180
aataaatgaa	tgatagggtc	ttctgtattg	gccaggctag	tctcaaattc	ctggcttcaa	42240
gagatcctcc	caccttggtc	ttccacagtg	ttgggattat	agacatgagc	cattgtgctt	42300
ggcccaagac	tggtattctt	aaaaagcttc	ataaaaagca	tggttaatcc	ttggctggca	42360
cctgggaact	tagatttcag	aagggttccc	accatccaac	ctggaaagag	ggactcactg	42420
tgccataaatt	attgtgtggt	ttatgctgaa	ctcctgcttt	tcttcaggta	gcgtggaatg	42480
tggtatgtgc	tggtgcaagg	gggctgcat	gaccagcccc	caataaaaaac	cctgggtggt	42540
gggtctctag	tgagtttccc	tggtagacag	catttcacat	gcgtgtgtcac	agctccttcc	42600
tcggggagtt	aagcacatac	atctgtgtg	actgcactgg	gagaggatgc	tggaagcctt	42660
gtgcctggct	tcctttggac	ttggcccat	gcacctttcc	ctttgctgat	tgtgctttgt	42720
atcctttcac	tgtaataaat	tacagccgtg	agtaaccac	atgctgagtc	ttccaaagta	42780
accactcagat	ctgagctagg	tcctgggggc	ccccaacaca	gaaataaatt	ataaaagacc	42840
aaggactggg	catggtggcc	catgccggtg	atctcagcgc	tttgggaggg	cgaggcagga	42900
ggaccagtta	agcccaaaag	ttcaaagtta	cagtgacctg	tgactgcgcc	aatgcactct	42960
aacctgggag	acagagcaag	accctgtccc	caaaacaata	aactaaacac	atacttctgc	43020
cttccaagtg	tcttaaaatt	caatggaatg	gtagaaacat	ttttaaaaca	ctaaatcaaa	43080
agaaacctgg	aaaacaagag	tgccgatggc	caactaaaat	gtctaggaaa	tttctgaaaa	43140
gtaaaaagta	ctcagaacca	gattacctga	gcaaaccata	gccaataaca	agcttgggag	43200
gaggctgtta	tgagaagga	aatggtaaca	gggtttccagg	aacagacttg	taacagcaga	43260
tagaacagca	gaggtagaac	ctgacaaggt	gattacctgg	ggaactgcag	tctgaatgac	43320
caggactggt	ggaccttccc	cctcacatgg	aatacacacg	ccactcagca	gcacaccaca	43380
gctcttcaac	aatcacagga	ggcacgctac	gcctagtaag	acaggaaaaa	aggaattctc	43440
aaacttcgaa	gatgaacaca	taaagaatca	ccaagttttt	attcagtatg	atgaaacagg	43500
gacactgaat	caacagaaca	caaaaccaa	caaagataat	tactagagca	catagaagaa	43560
attattagat	attcttggga	agacctaaag	ggacattata	aagagcaagc	agttgggtatg	43620
tgacgatctt	tgtgatatac	caagaaataa	aaacacagga	tgaagaccag	atagagaata	43680
atgtactact	ttgtgcaaaa	aaggagaaat	ggagaaatctg	attcatattt	gcttgtattt	43740
gcatgaagaa	actttggaag	gtacataagt	aactaacaac	aatgggtacc	tacttgttaag	43800
gagagagaag	taagaggaca	ggaatgggtg	gaacaccttt	tgtgtccgga	attggtgggt	43860
tcttggctcg	acttggagaa	tgaagccgtg	gaccttcgcg	gtgagcgtaa	cagttcttaa	43920
aggcgggtg	tctggagttt	gttccctctg	atgtttggat	gtgttcggag	tttcttccct	43980
ctggtgggtg	cgtagtctcg	ctgactcagg	agtgaagctg	cagaccttcg	cggcgagtgt	44040
tacagctctt	ggagtgagcc	atctagagtt	gttcgttccct	cctggtgagt	tcgtggtctc	44100
gctagcttca	ggagtgaagc	tcgagacctt	cgaggtgtgt	gttgagctc	atatagacag	44160
tcagagccca	aagagtgaagc	agtaataaga	acgcattcca	aacatcaaaa	ggacaaacct	44220
tcagcagcgc	ggaatgcgac	cgcagcacgt	taccactctt	ggctcgggca	gcctgctttt	44280
attctcttat	ctggccacac	ccatatacctg	ctgattgggtc	cattttacag	agagccgact	44340
gctccatttt	acagagaacc	gattgggtcca	tttttcagag	agctgattgg	tccattttga	44400
cagagtgcgt	attgggtgctg	ttacaatccc	tgagctagac	acagggtgct	gactggtgta	44460
tttacaatcc	cttagctaga	cataaagggt	ctcaagtccc	caccagactc	aggagcccag	44520
ctggcttcac	ccagtggatc	cggcatcagt	ggcacagggtg	gagctgcctg	ccagtcccgc	44580
gcctgcgcgc	cgcactctc	agccctctgg	tggctgatgg	gactgggcgc	cgtggagcag	44640
gggtgggtgc	tgtcagggag	gctcggggcg	cacaggagcc	caggaggtgg	gggtgggtca	44700
ggcatggcgg	gccgcaggtc	atgagcgtg	ccccgcaggg	aggcagctaa	ggcccagcga	44760
gaaatcgggc	acagcagctg	ctggcccagg	tgctaagccc	ctcactgcct	ggggccggtg	44820
gggcccggctg	gccggccgct	cccagtgccg	ggcccgcgca	gcccacgccc	accgggaact	44880
cacgctggcc	cgcaagcacc	gcgtacagcc	cgcgttcccg	ccccgcctc	tccctccaca	44940
cctccctgca	aagctgaggg	agctggctcc	agccttggcc	agcccagaaa	ggggctccca	45000
cagtgcagcg	gtgggtgaa	gggtcctca	agcgcggcca	gagtgggcac	taaggctgag	45060
gaggcaccca	gagcgagcga	ggactgccag	cacgctgtca	cctctcactt	tcatttatgc	45120
cttttaata	cagctctggtt	ttgaacactg	attatcttac	ctattttttt	ttttttttt	45180
tgagatggag	tcgctctctg	tgcccagac	tggagtgcag	tggtgccatc	ctggctcact	45240
gcaagctccg	cctcccgggt	tcacaccatt	ctcctgcctc	aacctcctga	gtagctggga	45300
ctacaggcaa	tgcccaccac	gcccagctaa	ttttttattt	tattttttt	ttagtagaag	45360
cggagtttca	ccatgttagc	cagatggtct	caatctcctg	acctcgtgat	ccatccgct	45420
cggcctccca	aagtgtcggg	attacagacg	tgagccactg	cgccttcgct	atcttaccta	45480

29/122

tttcaaaagt	taaacttta	gaagtagaaa	cccgtaggcca	ggcgtgggtgg	ctcagcctg	45540
taacccagc	actttgggag	gccgagggcg	gcggtacacg	aggtcaggag	atcgagatca	45600
tcctgggttaa	cacagtga	ccccgtcgct	actaaaaata	caaaaaatta	gccgggctg	45660
gtgggtgggca	ccggcagtc	tcgctactgg	ggaggctgag	gcaggagaat	ggcgtgaacc	45720
tgggaggcag	agcttgagc	gagccgagat	agtgccattg	ccttccagcc	tgggagacag	45780
agcgagactc	cacctcaaaa	aaaaaaaaaa	aaaatagaga	cccggaaaagt	taaaaatag	45840
ataatcaata	tttaaaaaca	ctcaagagat	gggctaaaaga	gttgacggaa	caaactctaaa	45900
tattagattg	gtgacctgca	aaaccagccc	aaggaaacatc	ccagaatgca	gccccataaag	45960
ataaagagag	catttccgct	gggcacagtg	gtatggcagg	ggaattgcct	gagtcacaaga	46020
gttgacggtc	acattgaacc	acaccattgc	actccaggcc	tgggcaaacac	agcaatactc	46080
tgtctcaaaa	aaaaaaaaaa	ttaaattaaa	aaagacagaa	tatttgagag	aaaaaaatgc	46140
ttatttcaag	aaacatgaaa	gataaatcaa	gatattctaa	ttcccaagta	agaataatctc	46200
cagaagcaga	aaatagaata	gaggcaagga	aaacactcaaa	acttctccag	tgccatagaa	46260
atgtgtatta	atcttttagaa	tgaaaacggac	taccaaatagc	tgagcaggaa	gaacaaaaga	46320
gatccactct	taagccagtg	tgggtgcccc	gcgcagtgcc	tcattgcctgt	aatcccagca	46380
ctttgggagg	ccgaggcagg	tggatcacct	gaggtcagga	gtttgagatc	agtcaggcca	46440
acatgggtgaa	accctgtctg	tactaaaaat	acaaaacatta	gctgggtatg	gtgggtgcaca	46500
tctgtaatcc	caactacttg	ggaggctaag	gcaggagaat	cacttgaaac	caggaggtgg	46560
aggttgtagt	gagccgagat	catgccacac	tcccagcctg	ggtgacagag	caagattcca	46620
tctcaaaaaa	aaaatccact	cctagacaaa	taatatgttaa	attttagaac	accaaggaga	46680
aagaaaaaaa	attgtaaaag	ttcagagaaa	ataaacatta	actacaaaaga	aacgagagtc	46740
agacgcgtgc	acttcttctt	agataccagc	agataaaagca	atatctccaa	aattcagaa	46800
gttttaacgt	agaatcctat	accagtcac	gaatattcac	atggaaaagt	gaaataaaaa	46860
acattgttta	aacatgcaag	ggttcagaaa	gtttaccatt	cacagaatcc	ctgaaaaaca	46920
aaccaaataa	tcacttaagg	actcattaa	aaaacaaatg	aaataaaaag	accaatgatg	46980
agtaaatat	cagaaaaat	tacagtttac	ctaaataact	gtttatgcat	aatgtatgaa	47040
aacccaaaaa	tttaatatgg	gacagaatta	aaatcatgat	aagattcttt	tttgctttac	47100
tcatggagag	ttcacataaa	cagattatct	tttaatatgca	agagaaaaaa	atgttttagat	47160
atgtgtgaaa	aactaagggt	accaaaaacag	tgcaaatcca	tttatcatca	ggaaaatcca	47220
aattaaaaacc	acagtatcca	ccagaataac	taaaaggtaa	aagacagaaa	ttaccaagag	47280
ttggcaagaa	tgtggagcaa	ccacatatac	ttctggggta	aataagttgg	tgcaaccggt	47340
actgaaaaact	gtttgttagt	atctactaaa	accgagcaca	tgacagact	acaaccaagc	47400
agttccactc	ccagatcac	actcaacaga	aatgcacaca	ctcactcaac	aaaagacgtg	47460
tactagatg	ttcatgtact	tactattcat	aaatgtccaa	aaatgcacac	aaccaactgc	47520
caatcaaaagt	caaatgtata	tctatattag	ggatatatac	aatggcatat	acacagcaat	47580
gagaatgaaa	tgaaccagct	cggcacagtg	gttcatgcct	gtaatctcag	cactttgggc	47640
gggtaaggca	ggcagatcac	ttgaggtcag	aaatttgaga	ctagcctggc	caacacgggt	47700
aaaacctgtc	cccactaaaa	acacaaaaat	tagccgggca	tagtggttgc	aggcctgtaa	47760
ttccagctac	tcgggaggct	gggttgggag	aatcggttga	acccgaaaagc	cggaggtcgc	47820
agtgaaggca	gatcgtgcca	ctgcactcca	gcttggaaga	tagagcaaga	ctccgtctca	47880
aaaaaggaaa	tcaaaaatat	aaaataagat	gacaggaata	atccgcaaaa	gatcagtaat	47940
caaaaataat	ataaatgggc	taaagctacc	tattaaaaga	caaagatttc	acaccataa	48000
ggatagctac	tatcaaaaaa	agagagagaa	taacagatgt	tagcaaggat	gtatggaaac	48060
tgaaattctc	acgcattgct	ggtgagaata	taaaatggtt	cagcctctgc	ggaaaaact	48120
atgctgggtc	atcaaaaaat	taaaaataga	agtactactt	gatccaacaa	ttctacttct	48180
gggtatatac	ccaaataact	gaaagcagg	tcttgaagag	atattttgtac	acccatgatc	48240
atggcagcat	tattcataat	agctatgatg	tgggaaccaac	ataaatatcc	tttgataaat	48300
atatggataa	gcaaaatgtg	gtgtatacat	tcaatggaat	attaattagc	aataaaaaatg	48360
aagaaaaatc	tgacacatgc	tacaacatgg	atgaaccttg	agggcattac	attaaatgaa	48420
ataagccagt	tataaaaaag	caaatactat	atgaggtact	atattagata	ctcatgcaag	48480
gtacctaaaa	taggcaaat	catagagaca	aaaagcagaa	tggtggttgc	caggggctgc	48540
ggtaatggat	acagagcttc	aattttgtta	gatgaaaaaa	ttctggagat	tggttgcata	48600
acaatgtgca	cacacttaac	actgggggaa	tgtaaaactta	aaagtagtaa	atggtaaaaa	48660
taaaaataat	aaataataaa	ttttatgtta	ttttaccaca	atattttatta	aaagacaaa	48720
attaactaat	taaacaaaa	ccagccataa	gctaattggt	agagtaacaa	ttaaagaaga	48780
cacagaaaa	tgataaaat	tgactagaaa	aagatatatcc	atataaatgc	taacaaaaag	48840
caagtacagc	aataataaga	gaatgaacaa	aaaaaaaaat	aaataagatg	gctcgtttat	48900
tcccaaaagg	tacaattcac	caagaagata	caagaattgt	gaacctttta	gcacataaaa	48960
cagcttcaaa	aatcaaacat	ttaaagaaaa	acatatagaa	tacatacaaaa	tagtacaaaa	49020
accctacaa	gaatcataat	gggagctctc	aatacaactc	tccatatcaa	caggtcaaac	49080

30/122

agagaaaaaa	aataagttaa	ggatgcagaa	aacctgaatt	accatcaata	aacttgagat	49140
taatatagaa	ctgtataccc	aataatactaa	gagttcaggg	aacagtcgtg	actgacagtg	49200
gactgcaaat	taatctgttc	ttaatctttg	tttttctttc	agcactgtgg	cagaatagag	49260
atcctaaaaa	ccttccagct	acaaaacatc	tttttaaaaa	tataaaaaaa	tacaaaaata	49320
actctgaaat	caatagaaga	cacatgggtga	aacccaaatt	ctagaatata	gggagaataa	49380
aggcattttc	agatattaca	aaaaacagaaa	attgatcatt	gctgaagtaa	tttctaagaa	49440
atgtacttga	gggagaagaa	aaatgttcca	aagaaaagta	tctgtgatac	aagaagggaat	49500
ggaaagttaa	gaaatggtaa	acaggtagat	aaagctaata	aatgttgacc	tagaaaataa	49560
caaaaacaat	agcaataatg	tctcgttggg	aggggtgaag	taaaaataca	attaaggcca	49620
aatgtgaggt	aagtggatg	aaagaattag	aagtccctgc	ctgtttcaca	ggactgatta	49680
aataaatgag	ccaggttttc	cattcaaaaca	gttaaaactt	gaacaaaata	aactcaaatt	49740
aagtagaaag	ataaaaaaca	gaaattaatg	tcatagaaaa	ataaaaaatc	aatagaatta	49800
atcaataaat	cctgggttaat	aaaagctggg	tctttgaaaag	gattaataaa	ataatcatta	49860
agcaagtctg	atcaaaaaaa	aagagaaaaag	gtacccaaaa	aagtactgta	tcagaaagag	49920
aacatacaga	tacatacaga	tatgtaagag	tctgttttct	tacaccagaa	tactatatac	49980
aacattatgc	tagcatatat	taaatttcaa	taagtgttaat	gattttctag	gaaaacagaa	50040
aatattaaat	ttactttgaa	gaaacagaaa	aactgagaaa	aataaatgat	catgaaaaaa	50100
atgaaaagg	aattaaatac	tgatattaac	tgccctaaaca	acaccagcag	cagcccaggc	50160
agtctgaggt	caagttctgc	caaacttgag	ggaacagata	attcttctat	tccagagcat	50220
agaaaatgat	ggaaagtttc	ccaatttaat	cagagaggac	agcctgatcc	ttgttatgaa	50280
cacagataaa	aatggggtaa	actatatgcc	aaactcagat	acccaaaacc	taaataagat	50340
gctactttat	tgatttagaa	aatccaaaag	tgcattttaa	attagcccg	ggtttttagag	50400
aaagaaaaatc	tagcaatgtg	accaccactt	atgttaacaa	ttttaagacg	aaaatctaca	50460
tgatcatatc	aatgcacgtc	acacaaaagc	atttggggcaa	aaaacccaac	acccaccctt	50520
gactttttaa	actcttagta	attagccata	aacagaaaatg	tacttaatgt	gatagaatac	50580
actcgggtgaa	gatacagagg	gaatgctccc	taaaaccaag	cccaagacaa	agatttctat	50640
ttaacctcaa	tagtcaacac	tgacgcgaga	gtaatctatg	gaagacaagg	aaaaaagtaa	50700
aaacatagag	gacatctgtt	gtttaacaga	caataagatc	acctacttgg	aagaggcaaa	50760
cgaatcaagc	gaaaaactat	taaaactgag	acaggcttta	gtatggaggc	tcagcttcag	50820
ctgtagtttg	ggctaccaaa	ttcaactcgc	ttgcttggag	agttaatcct	gcaaagctaa	50880
tttctgttga	ttgataagcc	ttgacaagcc	tggtctcctc	cctcctcccc	catcttcaac	50940
actgaaataa	cacggtgttt	ggaactggat	aacagaatct	tccaaaaaca	aaaattgtcc	51000
tgaagggctg	acttgtgccc	ttactcaaaa	aacactttat	ctgctgcctg	cagctcctac	51060
agttgctggg	ggataagcct	gccaaaccagc	tcgggcgtaat	tcttcctgca	gaggggcaagg	51120
aagagcactt	tcacaggaaa	atttttttcc	gaactgtatg	ccgcttatta	cataaactta	51180
cgtgctggca	aatggagctc	cagcaaaaata	agatattcag	agtcaaaactt	ccttaggaaa	51240
aaaaaaaaaa	aaaagcaagc	acataaacact	aatttccttg	catgggcact	ggggaaggag	51300
gtcgttactt	ccgcacgccc	gcagggtccgc	accaccggga	aaccacggg	caccgcgcgc	51360
tgccccgggg	ccttccaggt	gcactgcgcc	gcggcgcccc	agctgaccgc	ggatgcccag	51420
ccctagccct	tccctgtca	ccccggccag	gaaggggagg	gagcgcggcg	gacgcggagg	51480
gcgaagggct	tctcggctct	ctgcaccacg	cagcaccccc	aaggcacaac	agggagggtg	51540
cgggaggctc	ccgagaccga	ggagccgggg	ccgggcgtgc	ccgcgcacct	gtcccactgc	51600
ggcgagggct	gggtctgcct	ccagggccgc	agctgtcggg	agccacctgg	ctctcagtcc	51660
cggggtccctg	cgacaaccct	cgggcccgga	ggggaggagg	cgccacacctg	ccgctgccac	51720
ctgcggcacc	ggtcccaccg	ctccgggccc	ggcaggacag	gccaggacgt	ccctcctggg	51780
ctggggacag	gacacgcgac	gagggggaccg	gggcccccg	ggcgaagacg	cagcacgcct	51840
tcccagaaag	gcagtcccgt	gcccccacga	cggactgccg	gacccccgcg	ctcgcccgcc	51900
catcccttca	gaccacgcgg	ctgaggcgca	aagagccggc	cgggcgggcg	gctggcgggc	51960
cggttagtca	tcaccggccc	cgctggctca	gcgcgcggc	aacccccagc	ggccacggct	52020
ccgggcgctc	actgatgctc	aggagaggga	cccgcgctcc	gccggcgccct	ccagccatcg	52080
ccgccagggg	gcgagcgcca	gccgcgcggg	gctcgtggg	agatgtagta	cccggaccgc	52140
cgcctgcgc	gtcctcttc	agccggcgcc	cgggggcccc	ctctctcca	gctctcagt	52200
tctcatctcc	tatatctgctc	atcctctggg	cgcacataat	cgatgtttgg	gcgtcccaag	52260
ccagatgtgg	accccatttc	cgcactctac	actggaggtt	ttctaagggt	ggtgcccgga	52320
ccagcagctt	cagcctcatc	tgggaacttg	agaaaaatga	gattctccgt	cccaccagc	52380
ctattcgggt	tttctgcac	taaaaccatg	aaggtggggc	ccagcagctc	acattctcgc	52440
aagcccgctc	agtgattctg	aggcgccctc	cagtttgaga	gctatgtcca	cggcctcacc	52500
tccgccccgc	aaggagcccg	gtcttgcctg	tgggcgtagc	cgcacacgga	cacctcatcc	52560
tgcggggccc	gccccccgc	tgccacctca	ccgcccaacg	cctcctccgg	gatgcagcgg	52620
aggcgctcgg	aagtcggcaa	ggtcaacatc	cccctcagca	tcttccctac	cctcacggct	52680

31/122

cctcctccag	gggtgcctca	tgcccgagg	ttagaaagag	ccactgtgtt	tcttgacatg	52740
gaagtggcct	aagaccttaa	tgaaaactgc	aggagtggaa	tgacagaacc	tttggtcata	52800
cttgagggcg	tgaagctcaa	atgaggagga	aggaaaggat	ccaggagaaa	taaccaaccc	52860
tggaaggttg	tgccgcccag	gtagaggggc	gagcctaggc	tagcgttctt	cgaccagggc	52920
cggtgttgcc	cctcctcgcc	gccccgcgta	cat ttgggga	ggtctggaga	cat ttgtgtt	52980
tgatcatgat	cgagggttgc	tactgttgcc	taagtgggta	gacacgaggg	tgctcctcaa	53040
catcctacct	gaaggacagg	actgccccac	aaagagaat	gatccggccc	caaataagaa	53100
accctgggct	ggtcagcaac	aacccttttg	ttctgagaag	agaggaggaa	agaataaaag	53160
aagtgggggtg	aagt ttttgg	ttggtagagg	aaacttgaag	acattttcac	tggaaaggaa	53220
gagagggaaga	ggaggagat	gtctgttaagg	acgagcaaac	cgggtgacag	ctgatttccct	53280
catattgaag	taatgagtc	tagttataat	aaattcctaa	taaaaaccca	gtttatccct	53340
gcaataaaact	tgctcttttt	ttttaaatat	actgttgat	tctgtttgct	aatattttat	53400
ttacaggcctt	tgcat tgata	tgcaaaaatg	agatgggcaa	taattttctt	tttgaatgtc	53460
taatgttgtt	tggttttcaga	atcaatgtta	tgctcacatc	ataaaaaatt	tggaaaccgag	53520
gcaggaggag	tgcttgaggc	cagaagttcg	agaccagtct	aggaaacaca	gtgagacccc	53580
cccattccta	caaaaaaaaa	aaaagaaaaa	tgatgggca	tggtttgctt	ttccttttac	53640
tctgaacaat	ttaaggagca	ttaaaattat	ctattctttg	aggtttgatc	atttcccagt	53700
taaaaatggt	cctcccagcc	tgatgtcttc	tttggggagg	gtaaatcttt	taaggctaga	53760
aaagt tttctt	ctgtggcaat	tttattat	actttttaa	aattattcta	gagtttaatt	53820
tgataaagca	tgattttctt	aaaacaaatt	atcctttttt	tccagatgtt	caagtgtatt	53880
tgataaaagt	tgaggaaagt	agtcttttgt	gaatctttta	acttctccca	aatatcttat	53940
tttgtgtatt	tgtgtctctt	tattttgtta	actttttaa	gtgtattttt	tttcaaaaga	54000
atcagctctt	aggtttatgt	ttttggttat	actggagctt	ttttcttctt	ctttttaaaa	54060
tattttttct	cctttatttt	ttagacgtat	tttgatctaa	cgtaatcgga	agaaggtaaa	54120
ttagaatctt	ttgttactat	tggtttttta	tttctcctta	tttctctgaa	gtcctgcttt	54180
ataaatagta	ccatgttatt	tgtgcataaa	tattcatttg	tcttatattc	ttgggaattt	54240
tcccacttca	tcataaaatg	accttccttg	tctcatttaa	tgtgttcaaa	ctttgcccctg	54300
aat ttaactat	tgcttgatat	tttaccatcc	tgctgaattt	tggtttgttac	cccaaacac	54360
ctttgtctgt	ttcgtctttt	ctgaaccctt	tatttttaggt	aatcccttga	attagagcac	54420
taagt ttttgc	tttgtgatta	aatctgaaaa	tctttatctt	gccatagatg	agttgagccc	54480
tattcatgtg	acagctatat	tatgtgtttt	catagccctt	ttggtccttt	tttactctt	54540
gcattgcata	ttttgtgttt	attgtgtttt	gtgtttcttc	tgataatttg	gaagggttgt	54600
at tttttatc	agggagttgc	cttataatca	tactccgcaa	tacacatcgt	cctcagtttc	54660
ttcagactgt	ctgttaactc	cctattctga	ataaaaatga	cattgttaatt	tccctctttt	54720
ttctttaccc	cttttcttct	cctcacctaa	tgtaaatgat	tttatccttc	tttagtattt	54780
gcttttttaa	ttactacat	ttataaatat	ctttatcact	tgatttttaa	atcagctttg	54840
aatgagatat	ttggattcct	agatataaaa	agtggttaatt	ataccatttc	caggttagta	54900
ggtttataaa	atcatacatt	ctgctgtgta	accataatcc	cacgtttgtt	ttagttccac	54960
tcctacagtt	aaaagattca	gaagtattat	taacagttat	tttgcatag	ttttttcccc	55020
aacccatttt	gtggttaagtt	atgatcctgc	tttagtttct	taagaataat	ttatagagca	55080
gagtggtgtg	gctcacgttt	gtaatcccag	cactttggga	gacaagaggt	agaaggatcg	55140
cttgaagcca	gcagttcaag	accaccctga	gcaacatagt	gagaccttgt	ctctacaaaa	55200
aat ttttaaaa	tttagccaga	cgtagtgccg	tggtccctata	gtcccagcta	ctcaggaggc	55260
tgaggcaaga	ggattgctag	agcccagaag	tttgaggctg	cagtgcctc	tgattgtgcc	55320
actgcacccc	agtctgggca	agaaagttag	aacctatctc	tttaaaataa	caataataac	55380
ttatgaaaaat	tatatccct	gagtttttca	tgtttaaaaa	tatttgttgc	ctttatcctg	55440
taaaagt tttg	agtataaatt	cttgggttat	actttattta	ttgaagaatg	tataagtatt	55500
gtcttctaga	attgagtggt	gctgtaatga	aaccagaagt	cagcctgggt	tatttttctt	55560
cagaaatgag	gtaattgccg	gccggacacc	gtggtcatg	cctgtaatcc	caacactttg	55620
ggaggccgag	acaggtggat	cacgaggtca	ggagattgag	accatcctgg	ctaacatggt	55680
gaaaccccg	ctctactaaa	agtacaaaaa	gttagctggg	catggtgggt	gacgcctgta	55740
atcccagcta	ccgaggaggc	tgaggcagga	gaatggcgtg	aacctgggag	gaggagcttg	55800
cagagagctg	agatcgcgcc	actgcactcc	agcctgggcg	acagagttag	actccgtctc	55860
aaaaaaaacaa	aaaaaaaaca	aagaagtga	gtaattgcca	tgatgctcca	agaatttatct	55920
ctttgtctat	gaaatccaga	aatctcactg	ttatataatt	tggaattatt	attctggggc	55980
aatatttctt	gggacacaat	agattgactc	tatagattta	at tttttttt	tttttttgag	56040
acagagtctc	actgcaatct	cagcttactg	caacctctgc	ctcacgggtt	caagcaattc	56100
tcctgctcca	gctctccaa	tagctgggac	tacaggcgcg	tggaaccatg	cctgggcta	56160
ttttgtcttt	ttagtagaga	cagggtttca	ccatgttggc	caggctgggt	ttgaacgcct	56220
aacctcaagt	gatccacctg	cctcagcctc	ccaaagtgtc	gggattacag	gcgtgagcca	56280

32/122

ccatgcccag	cctcaattcc	tctttctatc	tggtaatttt	tctgaagttg	aaaacatttg	56340
ttctaatacg	ttatttcagt	gttcttctaa	gatgtgtaaa	gcaccctatt	cccagggtcag	56400
cccccatctt	gctagtgcag	tcggctgggt	cttcacaaga	gctctgggtt	tctcctgctt	56460
aatctcaagt	acctctgtca	gcctccacct	ggtttatgat	ttggagtttt	ttgggtttttg	56520
ttttttgttt	ttgacagagt	cttactctgt	caccagggt	ggagagcagt	ggcataatct	56580
cagctcactg	caacctctgt	ctcccagggt	tgagcgattc	tcctgcctca	gcctactgag	56640
tagctgggat	tacaggcgcg	tgccaccaca	cccggctaatt	ttttgtattt	ttagtagaga	56700
tggggtttca	ccatgttggc	cagggtgggt	ttgaactcct	gacctcaggt	aatccacctg	56760
cctcagcctc	ccaaagtgtc	gagattacag	gcgtgagcca	ccgcgcctgg	catgggttgg	56820
agttttaatc	tgtagtttta	ataaagatag	tgcttatggt	tgtgtttcct	atatttcttg	56880
gtactcttgg	gtaatttgta	agatcccat	atctacacaa	gaagtccatt	ttcaattctt	56940
ttcttcagac	tgtttatttt	attttatttt	attttatttt	tatgtttgag	atggagtctc	57000
gctgtgtcac	ttctggagac	tggagtgcag	tggcgcgatc	tcaggtcact	gcaacctccg	57060
tctcccggtt	tcaagcaatt	ctctgcctc	agcctcccga	gtagctggga	ttacaggcac	57120
ctgccacttt	ttaatttttt	tagagacaga	gtctcgcttt	gttgaccagg	ctggagtgcg	57180
tggttgcaat	catgggtgac	tataacctcc	aaatcctggg	ctcaagtgat	cctcctgctt	57240
cagcctctctg	agtagctggg	actacaggca	catgccacca	tgcccagtta	attttaattt	57300
ttttgtagag	acaggtgtct	cataatgttg	ccaggtgggc	ctcctactcc	tggcctcaag	57360
taactctcct	acctcagcct	cccaaattac	taggattata	agcatgagcc	accatgcca	57420
gccttgttct	actactttta	tttcatatgt	taggtgacca	tgtaattgat	catccaaacc	57480
aggataactg	aagaatgaaa	gaggctgaca	gtagtatgat	gctgggacta	gcatttgtca	57540
ctgagattat	ttctgggaaa	gcaggagata	cggtcaccct	acttatagtg	tgcttgtctt	57600
tggattgttg	aatttggagt	ttctatttgc	aggtcttatt	caactgggca	gccttgatcc	57660
gccctggcca	gcaatgctac	cgttctctcc	accgggtctc	tgggaccctt	tcagtacta	57720
tactttgcat	agttccccac	cctcccactc	cctaaaagcg	taaccaggaa	tccctgctca	57780
gggtctactgc	cgtcttccgt	gggtctgttc	agttccatt	accagagtc	aaactcccag	57840
cattccctac	ctgattccag	acttggagtc	cagagcttta	acctcttcag	gccaactccc	57900
cactttgcat	ttctgtccct	atatcttagt	ccatggagat	acatttcag	tctttgagtc	57960
tacttcaaaa	gtaaattttg	ctgtttttta	atttttttt	tgagatggag	tcttgccctg	58020
tcacccaggc	tggtgtgcaa	tgacgccatc	tcggtcact	gcaacctccg	cctcctgggt	58080
tcagagcatt	catctgcctc	agcctcccaa	tgagctgtga	ttacagacag	gcaccaccac	58140
gcccagctaa	ttttttttat	cttttagtag	agacagggtt	tcaccatgtt	ggccaggctg	58200
gtcttgaatt	cctgacctcg	tgatctgccc	atctcggcct	cccaaagtgc	tgagattaca	58260
ggcgtgagcc	actgtgcccc	gccaattttg	ctttttttat	atttcattgc	tatatgttta	58320
gaggataagt	ttacagtgtc	atatgcattc	ccaaatatta	gacccaaaaa	atctccaaaa	58380
aattagaag	aaaatccaaa	aaatctcaaa	aaataccaaa	aagcaacaa	ctcacagacc	58440
atactcactg	accccccaata	aaataaaatt	agcaaataac	cacaacttaa	caaaaataaag	58500
tactcaagtc	agagaggaaa	gaggaaataa	acatcaaaat	tacaaagtct	aggcgggtggc	58560
tcacgcctgt	aatcccagca	ctttggggagg	ccaaggcggt	cagatcacaa	ggtcaggaat	58620
tcgagaccag	cctgggccaat	atgggtgaaac	cccggtttcca	ctaaaaatac	aaaaatttagc	58680
caggcatagt	gatgtgtgcc	tgtaatccag	ccacttggga	ggctgaggca	ggagaatcac	58740
tgaaccagg	gagacgaaga	ttgcagttag	ccaaaatcgt	gccactgcac	ttcggcctgg	58800
gtgacaaagc	gagactccat	ctcaaaaaaa	aaaaaattac	aaactcttta	gatagaaatt	58860
ttggtgtttt	tttttgagac	ggagtctcac	tctgtcgcag	aggctggagt	gcagtgggac	58920
tatgtcagct	caccgcaacc	tccatctcct	ggattcaagc	aattctcctg	tctcagcctc	58980
ccaagttagct	aggattacag	gcgcccacca	ccagaccag	ctagttttta	tatttttagt	59040
agagatgggtg	tttcaccatg	ttggccaggc	tggtctcaaa	ctcctgacct	caagtgatcc	59100
acctgttca	gcctcccaaa	gtgctcagat	tacaggcggtg	agccaccgca	ccccacctag	59160
atagaaaatt	caacatgagg	ccgggcacaa	tggctcacgc	ctgtaatctc	agcactttag	59220
gaggctgagg	cgtgggagga	tcacttgggc	ccaggagttc	aggaccagca	tgggtgacag	59280
agacagacc	tgtctctatt	tatttgaaaa	aaaaaaaaaa	aaagagagag	agaaagaaat	59340
ttcaacatga	aaagtatctc	tcaaaccctt	cagatgttg	gcaaaaagcg	actcaaagga	59400
aaatgtatta	ctgtgtgtga	atgtgcttga	aaataagaaa	gaggccgggt	gtggtggcta	59460
acacctgtaa	tcccaacact	ctgggagtc	gaatcaagt	gatcatgagg	tcaggagatc	59520
gagaccatcc	tggctaacc	ggtgaaacc	tgtctctact	aaaaatacaa	aaaattagct	59580
aggcgcggtg	gctcatgcct	gtaatcccag	cactttggga	ggctgaggca	ggtggatcac	59640
ctgaggtcag	gggtttgaga	ccagcctggc	ctacatggtg	aaacctcgtc	tcttctacaa	59700
atacaaaaat	tagctgggag	tgggtgggtg	tgcctgtaat	cccagctact	cagaggctga	59760
ggcaggagaa	tgctttgaac	ccgggaggcg	gaggttcggg	tgagccgaga	tcgcaccact	59820
acactccagc	ctgggcaaca	gcctgggtga	cacagtgaga	ctccatctca	aaaaatacaa	59880

33/122

aaaattagct	gggtgtggtg	gcctgcgcct	gtagtcccag	ctacccggga	ggctgaggca	59940
ggagaatgga	gtgaacctgg	gaggaggagc	ttgcagtggg	ccgagatccc	accactgcac	60000
tccagcctgg	gcgacagagc	aagactcttg	tctcaaaaaa	aagaaaaaaa	aaggaaaaaa	60060
gaacctgat	aataaaagaa	ccaaatgttc	aactctcaaa	gctcggacac	tttaaagaaa	60120
taattaataa	aggcagaagt	taaaaggagg	atgataaagc	aatttttttt	gttggttttt	60180
ttgagatgga	gtcttgctct	gtcaccaggg	ctggagtggc	gtgatgcgat	cttggtcac	60240
tgcaacctct	gcctcccggg	ttcaagcaat	tctcctgcct	cagcctcctg	agtagctggg	60300
actacagggtg	cgcgccacct	ggcccageta	atttttgtat	ttttattaga	gacggggttt	60360
caccatattt	gttaggctgg	tctcaaactc	ctgatctcag	gtaatctgcc	cacctcgccg	60420
tctcaaaagt	ctgggtattac	aggcaggcgc	caccgcgcct	ggcctaaaagc	aaaatattgg	60480
ttctgtgcaa	aaggccaata	aaaagagcaa	acgtttacaa	actggagcca	gcacccattc	60540
agctcagtg	gtctggagaa	aaaacaatct	cgcttcagaa	ttcatgatta	cgcagccctt	60600
tttgcttctc	aaaaatccta	ctatgttgct	gttgaccatt	ctctctcttt	ctctctctct	60660
tgctttctct	ccagaaaagc	tattcagaca	ttctctctct	ttctcaaac	tccaacactt	60720
cctcctcat	ccttagcctc	agctgtgac	ctcacttcta	atcattgaga	aaccaggaga	60780
agcatttaag	agtgaaacct	cgctcccccg	cacggggcaaa	accacccacc	cacagaattg	60840
tgcccccaatt	ctgcgtctct	tcctctcacc	atggatggac	ggccagggtc	ccgagccaaa	60900
gccaggcctc	ccctggagct	ctggatccac	cacctgcagc	ttctcaggca	gggccccagc	60960
agctccccct	ctcccttgta	ccatcaatcc	ctccccctac	tggtgcactc	ccaacaatat	61020
atatattttag	tgatgtttct	cccatgtggg	aaaatcactt	agcctctctc	ctccccagc	61080
tactatctta	tttgtttctt	tccattctct	gcaaaaactt	tcaaagcatt	gtgtctatgt	61140
gctgaactca	tttatctctt	cccgtctctt	gctgagtcct	tcccacagac	tctcacccca	61200
gttactccat	gaaatgacct	ctgcactgcc	acatccaatg	gtgaatgttc	agtctctaat	61260
tttattcagt	ctttcagcag	catttgacct	ggccgatcac	ttccctctct	taaaaatact	61320
tttctcagcc	aggcgtgatg	gctcacacct	gtaatcccaa	cactttggga	ggccaaggcg	61380
ggaggatcat	gagagcccag	gagttcaaga	tcagcctggg	caacatggca	agaccctatc	61440
tctacaaaaa	ctaaaaagta	gccagtgtga	tggtatgcac	ctgtagtccc	atctacttag	61500
gagctgagg	cagttagctg	acttgagcct	gggaaatcaa	ggctgcagtg	agccatgatt	61560
gcaccactgc	actccagcct	gagtgacagc	gagaccctgt	ctcaaaaaga	caaaatagga	61620
aacttttctc	agcatattcc	tctgattctc	ctgctgcttc	tgtctgcaca	gattcagttc	61680
cctttgccgg	ttctctctca	tcctctcgat	ctcttgacct	tgaagtggcc	cagagtacag	61740
tctttttttt	tttttttgag	acgcagtctc	gtctgtcacc	caagctggag	tgcaatggcg	61800
aggtctcagc	ctatgcaacc	tctgcctcct	gggttcaagc	gatttctcct	cctcagcctc	61860
ccaagttagc	aggactacag	gcacatgcc	ccatgcccag	caaattgttg	tatttttagt	61920
agagacaggg	ttttactata	ttggccacgc	tggtctcaaa	ctcctgaact	cgtgaaccac	61980
ccgctcggc	ctccccaaag	gctgagatta	caggcatgag	ccaccacacc	cggccccagag	62040
tacagtcttt	agacggcctc	tctacctata	cttgctcccc	tcataaaact	ctcctgcctc	62100
atggctttaa	ataccatcgg	tagactgatg	actcccatat	ttctcttttt	tttttgagga	62160
cggagtctcg	ctcagtcctc	caggctggag	tgcatgtggc	cgatctcggc	tcactgcaag	62220
ctccacctgc	caagtccaca	ccattctcct	acctcagcct	ctccagtgc	tggtgactaca	62280
ggcacccgcc	accacgcctg	gctaattttt	ttgtattttt	agtagagatg	gggtttcacc	62340
atgttagcca	ggatgggtct	gatctcctga	cctcgtgatc	cgcccatctc	ggcctcccaa	62400
agtgtcggga	ttatagggtg	gagccaccgt	gcccagccga	tgactcccat	atttctatct	62460
cttgctgtgt	gggagtctct	ctcagaactc	catactcata	aatccaactc	tcataaatag	62520
tatctcaaat	gggcaatatg	ctcaaaaagtc	aattcctact	tttctcccta	aacttgcttt	62580
cctgcagtc	ccaccatctt	aatgtccaat	ctaaccattag	gaggcaaaaa	ctttgaagtc	62640
attcttgact	cttctctatt	acacacccta	tccaatcttt	ctgcagatcc	agtcgacccc	62700
caaatccagt	tagctctcat	catctccctt	gttaccctct	gggtccaggcc	atcttctctt	62760
ctcacctgaa	tcactgcagc	attctcctca	ctggctctct	tggttctgtt	ttcactccac	62820
cttagcatag	tctccacaga	gcagtccagc	ggatcctttt	aaagtgtaat	tcccatcctg	62880
tcctgtctct	gctcaaaaacc	atgctcgtgat	tcccggttta	atctgtcaga	ttaaaagcca	62940
gagctcttcc	agtgcactac	ctgatctgcc	tattatcacc	tcccacttct	ttccccttgc	63000
tcactccact	ccagctctgc	agctgtcctt	tctgtttcct	gaacagccca	gattttgctt	63060
ctttagaacc	tttgattttg	ctgtccccct	tgtctggaat	gtttttccag	gaagtcaact	63120
ggctctctcc	tgcatctcct	tcttgaccac	catgtttaaa	aatcactcaa	acacacttca	63180
ggccggacat	gggtggtcac	gcctgtaatc	ccagcacttt	gggaggccaa	gggtgggtgga	63240
tcacactgag	tcaggagttc	gagaccagcc	tggccaacat	gggtgaaact	cgtctctact	63300
acaaatacaa	atagtagcca	ggtgtagtgg	cacacactcg	taactctcag	tactcaggag	63360
gctgaggcag	gagaaatcgct	tgaacccaga	aggcagagga	gggtcagtg	gccaagatca	63420
cgccacaaca	ccccagcctg	ggtgacagag	caagacccca	tctcaaaaaa	aaaaaaagaa	63480

34/122

aaaaaaaaatca	cacaaacaca	cttctcttca	tattcctttt	ccaagtttta	tttttctcca	63540
gaatacttta	cattgtttta	atggaagttc	tccgtttccc	cccaactaga	atggatactt	63600
cctgcaggta	ggcactctag	tccctccatc	caagtactaa	ccagggtcaa	ccctgcttag	63660
cttctgagag	caggggagat	caggcctgtt	cagggttgta	tggcccagga	attttgattc	63720
tgttttattc	attgctgttc	tggtgattct	cttttgttcc	tcctcctagt	gctgagaaca	63780
ctacttgtac	ataataagca	ttcaataaat	atgtgttgaa	tgaatgactt	gttgaatgaa	63840
ttaatctcag	aaatgcagga	ctgggttctac	attagaaaaat	ttttcaaggt	cattctctgt	63900
tgctgtaaca	cattaagaga	ggaaaaat	gtactctaaa	tcatttgata	aaatacatatc	63960
tgatttctgt	tttcaaaaac	tcttagtggtc	tgggcgaggt	ggctcacatc	tataatccca	64020
gcattttggg	aggacgaggt	gggcggatca	cttgaggtca	ggagtttgag	accagcctgg	64080
ccatcatggt	gaaaccctat	ctctactgaa	aatagaaaaa	ttagccgggt	gtggtggcgc	64140
atgcctgtag	tccagctac	ctgggaggct	gaggcaggag	aatggcttga	accggggagg	64200
cggaggttgc	agtgaagcaa	gatcatgcca	ttgcactcca	gcctgggtaa	cagagtgaga	64260
ctccatctca	aaagaaaact	cttagtgagt	ttaggaatcc	aagggaagacc	ctcaaaactaa	64320
atagataaat	tagctaccag	aagccttcag	taaaccttaa	cactccatgg	tgaacatta	64380
gaaactctcc	tactaaaaga	caggctaa	atgcctgcaa	tcttcacggc	tagtccaaga	64440
agtcaaaaag	aagaaatgag	cgctgattta	aaaaataaaa	caaacaaaaa	actaccgatg	64500
cagaggctgg	cagcaaggac	tgaaggactg	tacagtactt	gcctggagca	ggcggatggc	64560
cacaccctgc	cgaagcctgc	tcagctggct	gggggacgct	ccagtgtgtg	agtggcagga	64620
tgaggggtac	ttcctctgcc	agggagtgtc	actggggaga	tcctcccca	ctcacacttt	64680
ggcagctggg	gctttggaat	gtgacttagc	ttctgtcaaa	gggtcaatcc	accctttgat	64740
atatgatgca	aaggcgaaaca	tatgatgcaa	aggtgagaga	acagcccaaa	ttaggacttt	64800
taccacagct	gtggagggtg	acagcgacag	tgggtggccc	tggccagact	tttcatgctc	64860
aaaggtgggt	gttgttcttc	ctacttcttg	tcctccagg	gcttcctttg	cctgtgtgct	64920
gaacctgctt	cttttaattt	tttttaactt	ttttaaat	tttaattgtt	taattaaaac	64980
aaattttgaa	aactgtctga	acctgctttt	gaacctgtct	atgatttgaa	tgtttgtccc	65040
ctgccaaact	gattttgaaa	cttaactctc	aaagtggcaa	tattgagatg	gggctttaag	65100
cagtgaactg	atcatgagag	ctctgacctc	atgagtggat	taatggatta	atgagttgtc	65160
atgggagtg	catcagtggt	tttataagag	gaagaattaa	gacctgagct	agcatggctc	65220
cccttcaccc	atttgatata	ttacactgcc	taggggtctc	gcagagagtc	cccaccaaca	65280
agaaggtctc	caccagatac	agctcctcaa	cctgtacttt	ctcagcctct	gtaactgtaa	65340
gaaataaatg	ccttttcttt	atgaattacc	cagtttcaga	tattctgtta	taaaccaatg	65400
aaaacgaact	agggcaaaact	ctcatgatct	tactgccatg	ccattccaat	aaactccctt	65460
tatgcttaag	atggccagag	ttggccaggc	gtgggtgactc	acgcctgtaa	ttccagcact	65520
ttgggaggcc	gaggcaggtg	gatcacagg	tcaggagatc	gagaccatcc	tggctaacac	65580
ggtgaaaccc	cgtctctact	aaaaatacaa	aaaaattagc	tgggcgtggt	agtgggtgcc	65640
tgtagtccca	tgactcggg	aggctgaagc	aggaggagaa	tggcgtggac	ccaggaggcg	65700
gagcttgag	tgagtgcaga	tcgtgccact	gcactccagc	ctgggtgaca	gaatgagact	65760
ccgtctcaaa	aaaaaagaga	gccagagttt	atctctgttg	cttgcaacca	agaaatctgg	65820
ctggtgcact	gaagtttcca	taataaatag	caatttaaag	actctttcca	agccaggcaa	65880
tgcttagcct	tggtgagtcc	ttgtggtaat	acattcattc	attcatttgt	tcaaccaact	65940
gtgctccaga	gactaagaat	acaaaaatgg	gggcccgggtg	tggtggctca	cacctataat	66000
cctagcactt	tgggaggccg	aggcaggtag	atcacctgag	gtcaggagtt	cgagaccaac	66060
ctggccaaaa	tggtgaaacc	cctactctac	taaaaaatac	aaaaattagc	tgggggtggt	66120
ggcggacacc	tgtaatccca	gctactcgtg	agactgaggc	aggagaatca	cttgaacccg	66180
ggaggcagag	gttgtagtga	gccagatcg	caccactgca	ctccagcctg	ggcaacaaga	66240
gcgaaactcc	acctcgaaaa	aaaaaaaaaa	aaaaaaagag	ggccggggct	gggcgcagtg	66300
gctcacgcct	gtaatcccag	cactctggga	ggccaaggca	ggagaattac	gaggctcagca	66360
gatcgagacc	agcctgacca	acatggtgaa	accccatctc	tactaaaaat	acaaaaatta	66420
tccgggcgtg	gtggcgca	cctctagtcc	cagctacttg	ggaggctgag	gcaggagaat	66480
cgcttgaacc	cgggaggcag	aggttgagct	gagccgaaat	catgccactg	cactccagcc	66540
tggttgacag	agtgagactc	cgtctcaaaa	aaaaataaaa	aaaaaaaaaa	gaattcaaaa	66600
atttagagtg	tatagtgtgc	ttctagttaa	gttgagagga	catctgtcct	tcaagggaag	66660
ctagaatcta	taccctgagt	ccttactgaa	atcaatccag	cagtcaaaac	atgggaccaa	66720
cgatcacagc	agtaagatag	gaagagcacc	tttgtacatt	tagctcatgt	tgagataagc	66780
cactgcagag	gctgaaggaa	ctgcacagtt	ctgggttcca	tcctttggca	tttaaaaaga	66840
aaagtgtctaa	gaaaattcgg	ttggtcacgg	tggctcacgc	ctgtaatccc	aacactttga	66900
gaggcccaagg	caggcagatc	acgaggtcag	gagttcgaaa	ccagcctggc	caacatgggtg	66960
aaaccccgctc	tctactaaaa	acagaaaaat	tagccgggca	tggttggcgca	tgccataaat	67020
cccagctact	caggaggctg	aggcaggaga	attgcttgaa	cccgggaggg	ggagggtgca	67080

35/122

gcgagtgaga	gcaggccact	gcactccagc	ctgggagaca	gagcaagact	ctgtctcaaa	67140
aaaaaaaaag	aaaaaaaaagaa	agaaaggaaa	aaaagaaaga	aaaaaaaaaga	aaaaagaaaa	67200
ttcaggccag	gccaggcctg	gtggctcaca	cctgtaatcc	caacactttg	ggaggctgaa	67260
gcgagacggt	gccttagccc	aggagtttga	gaccagcctg	agcaacatag	cgagaccctg	67320
tctctataaa	aaaaaat ttt	tttttgcca	gacgcagtgg	ctcacgcctg	taatcccagc	67380
acttttgagg	gccgagggcag	gtggatcacg	agggtcaggag	atggagacca	tcctggctaa	67440
cacggtgaaa	ccccatctct	actaaaaaat	acaaaaaat	aaccgggctg	ggtggcgggc	67500
gcctgtagtc	ccagctactc	gggaggctga	ggcaggagaa	tggcgtgaac	ccgggaggcg	67560
gagcttgagc	tgagccgaga	ttgcgccact	gcactccaga	ctgggagaga	gtgagactcc	67620
gtctcaaaaa	aaaaaaaaaa	aaaaaaaaaat	taattgtcag	gtgtgctggc	atgcagctgt	67680
agtcctagct	actcgggagg	ctgaggtaag	aagatcgctt	gagcccagga	gttcaaggct	67740
gcagtaatag	tgccctctcac	tctaccctgg	gtgacaatga	gaccctctct	caaaaaagaa	67800
gaaaaaagg	aaagaagaaa	agaaagaaa	aaagaagaa	aaggaaaggaa	gaaagaaaga	67860
aaaagaaaa	gaaggaaagg	agaaagaaaa	aaaagaaaga	aagaaaaagag	agagaagttc	67920
aaagaccaaa	gggtcaggat	cccaaaatag	tttttatgtt	ttattttatt	atttacttat	67980
ttatttttga	gacagtatgg	ctctgtcgcc	cagcctggag	tcagtgatg	cgatttgcggc	68040
ctctcagc	ctccaaactg	ggctcagggt	gccctcccac	ctcagcctcc	cgagtactcg	68100
ggaccacagg	cgctgtccac	catgccagc	taatttttta	attctttgtg	gagatgaggt	68160
ctctatatgc	tgcccaggct	ggtctcgagc	tccctgggct	aagccatcca	ccgcctggg	68220
ctcccaaaag	tgctgggatt	acagaagtga	gccaccggcg	ctaactcgggt	ggtttgtttg	68280
tttattgacg	gggtctcgct	gctgccaggg	ctggagtgcc	agtggtctgt	cacaggtgca	68340
gtcctggagc	attgcatcag	ctctgggct	ctagcgatcc	tccagagttag	ctgcagctgg	68400
gattccaggc	tcggccaccg	gcggggctca	gaattgggtt	ttatatgtag	ggttatgctg	68460
ccacctagag	gatataatga	gtaccgaact	gtgtgcgcag	ggaggctgag	ggtgcagtga	68520
gccaaagtga	tgccaggggca	ctccagcggt	gggtgacagag	caagatttca	tctcaaaaaa	68580
aaaaaaaaaa	aaaaaaaaaa	aagaattgaa	agtaagggtc	tgaagagata	tttgtgcctg	68640
tatggtcata	gcagtattaa	ctttgaccca	ctagctaaaa	cacaaaagca	acatgtgtct	68700
gtcagcaggt	gaacggataa	acaaaatgtg	gtatatatgt	acaattgaat	attattcagc	68760
ctttaaaaag	gaataaaaagg	ctggatgcgg	gggctcacgc	ctgtaatcct	aacactttgg	68820
gagactgagg	tggtgtggtc	acccgaggtt	aggagtttga	gaacagcctg	gccaaactgg	68880
tgaacttca	tctctactaa	aaatactaaa	attagccggg	catggtggca	cttgtctgta	68940
atccaagcta	ctggggaggc	taaggcagga	gaattgcttg	aactcaggag	ccggagggtg	69000
cagtgtgcta	agatggcacc	actgcactcc	agcctgggca	acagagttag	actccatctc	69060
aaaacaaaca	aacaaaaaat	tattatttcc	aaagaaacaa	gacctgggt	ccattttcca	69120
gcccacacct	gatgttgact	cacaacacac	agcctgggtt	gctatgagcc	tgcttcattt	69180
aattgtcacc	ttaacttcac	atcacctcca	agtcctggaa	taactctttg	ctgacctttg	69240
gtgtgtgagc	catctccatg	tcgctcaacg	tgcagtccct	ctcactgcac	tgagtcaata	69300
gccagacgtg	gtctgactgc	agggtcatcc	ttgggtggct	agggtgactc	gggcatagca	69360
gggtgtctctg	agacctcacc	gcataatagg	tttgcccca	ataaaactcta	tataatatcc	69420
atattatgtg	gtctgggtgt	gtgtagcttt	gcactgtctt	ctcgtgacag	tgccctcaac	69480
ctctttccca	ggatttccct	ctctacctcc	tcaagtccca	ctgctctgca	aagaccaaaa	69540
gctgcagagt	cccagctccc	tcctttacac	cccacgacgc	agcctcctct	ctcagaaccc	69600
tttaaacaga	gtcttttact	gcagatccca	agaacagcca	cacctctctc	tcccaccac	69660
tccagacaca	ccagggtaat	tatagcacc	agggttaacta	tgtagatgga	gtccctggaa	69720
catgtggata	gtgcccctg	ggagtatgca	aaagcaacat	tgctggcacc	tgcaagaaac	69780
aggggtgacat	ccaggaatca	gagcatgggc	ctctgggagg	tagggatgtg	gccaggcagg	69840
ctggccaaaa	ttggtagagc	aaggccacag	gatctttctg	accttccttc	caaacagagg	69900
ctcctgtact	ggtgatccct	gtgttgattg	accactccct	tcctgggggt	cgtggtctct	69960
gtcccagttg	cccggacttc	tgtgagtgtc	ctactgaggt	ccttttcatg	agaagcatgc	70020
tgtccttcca	cctgctggga	gcaagagtga	caacttcaat	actataatag	cagtggcata	70080
cagagaagaa	gaaagatgaa	gtggcaagaa	aaacaggctt	ccaagcagga	gtttttctat	70140
aaaaacaaaa	acgtttacaa	gcaaaacttt	tataaagggc	tagatagtaa	atattttagg	70200
ctttgagagc	cacatagact	tgtttgagg	gactcaatgt	cgctattgta	gtttgaaagc	70260
agccatcagg	gttatgtaaa	tgagttagtc	tgattttgtt	tcagcaaaat	tttatttacc	70320
aaaacagaca	atgagtgggc	tgattttggc	ccatgatcct	tagtttgcca	actcctgctt	70380
tggtcctacc	cagatctgat	tttgaattct	ctgggttagct	ctgggttagct	gcaggagctt	70440
ggaaggctct	ctgagcctgt	ttcctcatct	gtaaaattaa	agcaataatt	tctaactctc	70500
aagagtgtta	cctcacgcct	gtaatcccag	cactttggag	gctgaggcag	gcggatcacc	70560
tgaggtcaga	agttcaagac	cagcgtggcc	aacgtggcaa	aacctgtct	ctactaaaaa	70620
atacaaaaag	tagccgggca	tggtggcgcg	catctgtaat	cccagctact	tgggaggtcg	70680

36/122

aggcagggat	actgctagaa	cctgggaggt	ggagcgtgca	gtgagtggag	atcacacctc	70740
cacactccag	cctggccgac	agagcgagac	tccatctcaa	aaaaaaaaaa	aaaaagagtg	70800
ttagaagggt	ttgagataat	gaataaaaaga	tgcttgtgt	ataactaagta	ttcaacaact	70860
gatagctgca	ttgggtcta	tataacaggt	tagaagcgat	tgagtcaca	aatgctggat	70920
ttgtcagggg	ggacttcta	tcaggaggta	gatcttgggc	tgagtcctga	agcaagata	70980
ggcattggat	agaggagttg	agagaacacc	ctaggactgt	tattattatt	attcgacacg	71040
gagtcctctg	ctctgtcacc	caggctggag	tgagtgggcg	cgatctcggc	tcactgcaac	71100
ctctgcctcc	caggttcaag	cgattctcct	gcctcctaag	tagctgagac	tacaggtgtg	71160
tgccaccaca	cccggcta	ttttatattt	ttagtagaga	cagagtttca	ccatgttggc	71220
catgctggtc	tcgaactcct	gacttcaggt	gatccaccgc	cctcagcctc	ccaaagtgtc	71280
ggaataacag	atgtgagcca	ccgcaccag	cccagaacca	tttttcaatc	cttggctctg	71340
ccttttatta	gctgcaagat	ctcaggcaat	ttatttaacc	tctccaaaga	ctcattttct	71400
cattcacaaa	atgaggcaaa	taataatata	tactatccca	ggttgtcatg	agaattaaat	71460
gcaacatgac	atttaatagaa	atgagaagtc	ccttggacat	taactggcta	aagtatgtgc	71520
tcgacaagga	tatcatttta	ggtggatact	tagcatctca	gaactgatgc	tcacaatgga	71580
atatcatctg	aacgcattaa	aattcatttt	aaatgattgt	aggtagttag	gcaattgaaa	71640
gaagaagaca	agaggactga	ttataatgct	tcaggctcac	tagtctcctt	ttaggaggga	71700
aaaacaattt	caagttaaat	tttaggctct	agattttttac	ccctgctgct	cattagaatc	71760
accagatttg	atgaaatcag	agcccatctg	aggtctgtgt	tttcatctcc	agaatgagag	71820
ctgttgtggg	gattaaagttt	ttgaaaaagt	acatctaaca	ggtgatcgaa	aatgatagtg	71880
atattattgc	agtgatggtc	atttattgtt	ttatttattat	actgaaagag	gcttcagttt	71940
tctgatccat	aaagttaggg	aattgcatga	gaccatttgc	aagattcctt	ctagctctgt	72000
ttttttgttt	ttgtttttta	gacagagtct	ctgtcgccca	ggctggagtg	caatggcatg	72060
atcttggctc	actgcaacct	ccgcctcccg	ggttcaaatg	atcctcctgt	ctcagcctcc	72120
gaagttagctg	ggactacagg	cacacaccac	catgcccagc	taacttttat	atttttaata	72180
gaggtggggg	ttcaccatat	tggtcaggct	ggctcacaac	tccctgacctc	aggtgatcca	72240
cccgcctcgg	cctcccaaca	tgctgggatt	acaggcatga	gccactgtgc	ccaacccctt	72300
ctagctttct	tgatcactga	ttctagggtt	ctctgtgtaa	atatatttga	gacatcctgg	72360
ataaaagatc	atgcaagagc	tcccaatatg	gtatttaataa	ttgattctgg	aggcttagct	72420
actcctgatg	gattagacat	gactcaactg	cctctcttat	gtgtacaaca	caacaacaca	72480
accaagaaag	gttattcttg	cattcatttt	attcagttta	tttacagccc	ttacttccag	72540
cagcacgtta	aagatatggc	cagggccggg	tgagtggtct	caagtctgta	atcccaggac	72600
tttgggaggc	caaggtgggc	ggatcacaa	gtcaggagtt	tgagaatctg	gcaattcttc	72660
agacttagaa	gcacaccgct	cgataacaca	ctcttgtgtg	ggctctccct	ctgtccctcc	72720
ctcgtctccc	tcattttctca	tccctgcccc	tgagactgtg	caccttcaca	tagccctgcc	72780
atgagacctt	catctcaggc	tttgctttct	ggggtaactg	aggctaaca	ctgagtggcc	72840
ctaaaaagag	attgggattt	ggaagttaga	ttattcacca	gagaacagac	tttgctgatg	72900
atcaggccca	ggttgtaatt	gttgaaaaaa	agagaggatg	catagtctta	tctcatctcc	72960
tagtcaaaag	caacaccatg	ataaataaga	gtcaaatcct	gagatgtgaa	ttggggacat	73020
ttgagtgggt	aaccctgaga	agcttgcacc	ttcagacccc	tcaatacccc	tgctccccag	73080
agaaggctgg	acattgacct	cagcacaggc	aggagccctg	caagatgcca	tttgtcctac	73140
taaaagatgga	cccctccact	ctgtttctag	gtaaaataacc	aaagtcaagt	ctccacacag	73200
cctgagcaag	aaagtccagag	cctgctacag	gagaaaaatac	cacactggcc	aaaggattca	73260
ctagccctgg	ccactgtgtg	tgggaggaac	cagggaaatca	tgtgtgggag	tcaatgttga	73320
agctgttggg	ctgggggtgg	ggtgggaatat	aagcctggcc	ctggggagtt	tttcccgttt	73380
gagggccttt	acccacaact	caagatccag	tgctatagca	ggagatccca	gagctagtcc	73440
taacagatgg	tcaggattga	acttggccta	gagtaaaatg	aggaggatag	tgccagaact	73500
ttctcaacat	actattgagg	aagaggtcag	aaggcttaag	gaggtagtgt	aactggaaaag	73560
gggtcctgat	ccagacccca	ggagagggtt	ccttggacctt	gcataagaaa	gagttcgaga	73620
cgagtccacc	cagtaaagtg	aaagcaattt	tattaaagaa	gaaacagaaa	aatggctact	73680
ccatagagca	gcgacatggg	ctgcttaact	gagtgttctt	atgattattt	cttgattcta	73740
tgctaaacaa	agggtggatt	atttgtgagg	tttccaggaa	aggggcaggg	atttcccaga	73800
actgatggat	ccccccactt	ttagaccata	tagagtaact	tccctgacgtt	gccatggcgt	73860
ttgtaaaactg	tcatggccct	ggagggaaatg	tcttttagca	tgtaaatgta	ttataatgtg	73920
tataatgagc	agtgaggacg	gccagaggtc	gcttttcatca	ccatcttggg	tttgggtggg	73980
tttggccggc	ttcttttatca	catcctgttt	tatgagcagg	gtcttttatga	cctataactt	74040
ctccttgccga	cctcctatct	cctcctgtga	tcaagaatgc	agcctagcag	gtctcagcct	74100
cattttacca	tggagctcgt	ctgattccaa	ctgccttgac	agcaggaaatg	ttggaaattga	74160
attactatgc	aagacctgag	aagccattgg	aggacacagc	cttcattagg	acactggcat	74220
ctgtgacagg	ctgggtgggtg	gtaattgtct	ggtggccagt	gtggactgtg	ggagatgcta	74280

37/122

ctactgtaag	atatgacaag	gtttctcttc	aaacaggctg	atccgcttct	tattctctaa	74340
ttccaagtac	cacccccgcg	ctttctcttc	ctttctcttc	tttctgattt	tactacatgc	74400
ccaggcatgc	tacggcccca	gctcacattc	ctttctcttc	ttaaaaatgg	actggggctg	74460
ggcgcggtgg	ctcatgcctg	taatcccagc	actttgggag	gccgaggcgg	gcggatcatg	74520
aggtcaggag	atcgagacca	tcctggctaa	cacgggtgaaa	ccccgtctct	actaaaaatg	74580
caaaaaacatt	agccaggcgt	ggttgcagg	gcctgcagtc	ccagcggctc	aggaggctga	74640
ggcaggagaa	tggcgtgaac	ctgggagggtg	gaggttgcaa	tgagccgaga	ttgtgccact	74700
gcactccagc	ctgggtgaca	gagcgagact	ccgtctcaaa	aaaaaaaaaa	aaaaaaaaaa	74760
tagctgggca	tggtggcgcg	tgccgtgaat	accagctact	ctggaggctg	aggcaagaga	74820
atcgcttgaa	cccagtaggc	ggaagtggca	gtgagccgag	atcttgacac	tgactccag	74880
cctggtgaca	gagtgagact	ctgtctcaaa	aaaaaaaaaa	agaaaaaaa	agacagaaag	74940
aaagagcaca	gacagagtca	caggtatttg	cagtaggaag	ctgtcagggt	agagtgcacg	75000
gaaatagaaa	gtatatttta	cacttacagc	acatctctcg	ttgattagcc	acatttaaaa	75060
tactgaatag	caacgtgtgg	ctatttagta	ttcactaaaa	tcttgagacg	tgcaagtcta	75120
aagaatcctt	gatccgtccg	gcatgggtgg	tcacgccttt	aatcccagca	ctttgggagg	75180
ccaaggtgga	aggatcaact	aaggtcagga	gttcgagacc	agcctggcca	acatggtgaa	75240
acctcgtctc	tactaataat	acaaaaaaa	ttagccgggc	atggtggtgc	atgcctgtaa	75300
tcccaggtag	ttgggagggt	gagcgaggag	aatagcttga	atccaggagg	cgctgcagtg	75360
agccgagatc	atgccatgcc	actactgcac	tcagccctgg	gcaacagagt	gagactgtct	75420
caaaaaaaa	aaaaaaattg	ttgggcgtgg	tggtcacgc	ctgtaatccc	agcactttgg	75480
gaggctgagg	ggggtggatc	acctgggttc	tgaggttcga	gaccagcctg	gccaacatgg	75540
tgaaacccca	tctctactaa	aaatacaaaa	attagctggg	cggtggtggt	ggcacctgaa	75600
atctcagcta	ctcaggaggc	tgaggcagga	gaatttcttg	aaccaggagg	gcagaggttg	75660
cagtgagcca	agatcgcgcc	tctgcactcc	atcctgggtg	gcagagcaag	actatgtctc	75720
aaaaaaa	aaaaaaatc	ttgattgtct	ggacattctg	cagaacatca	tatggagaca	75780
ctatgttgac	gacatcatgc	tgattgtgag	caagaaatgg	caagtgttcc	agaaacacag	75840
tcaagacaca	tacatgccag	aagtgagat	ataaactcta	ctaagattca	gtggcctgcc	75900
acactggtga	cttttttaaa	cctgctagat	gtttgtgtag	aaaaggattt	aaccttgccc	75960
aaagaggggt	ctggcctttg	tcccagcta	ctggacataa	tctcttttaa	ctcttgaaat	76020
atcatttcctg	atagaagtat	ttttgttttg	actaggggcc	ttgggcccagc	cagatagcaa	76080
caatgtgatc	tggtgtgggg	gctttggatc	aggtggcatc	agtgtgacct	cctgagtggt	76140
tagagactag	aatcaaccac	atgggcagac	aaccaggctt	acatgatgga	attccaataa	76200
agactttgga	cacaaggggt	tggttaagct	ttcctgggtg	gcaatgctct	atactgggaa	76260
accatttctg	actccatagg	gagaggacaa	ctggatattc	tcattttgta	cctccctggg	76320
ctttgcccta	tgcatTTTTc	ccttgtctga	ttattattat	tattatgaga	tggaatctcg	76380
ctctgtcacc	caggctggag	tgcatgggaa	tgactctaac	tcactgcaac	ctctgcctcc	76440
ccggttcaag	cgattttcct	gtctcgccct	cccgagtagc	tgggactaca	gatgcatacc	76500
accacaccgg	gctaattttt	ttgtattttt	agtagagacg	gggtttcacg	ttagccagga	76560
tggtctcgat	ctcctgacct	catgttcggc	ctgcctcggc	ctctcaaaag	gctaggaata	76620
catgtgtgag	ccaccgcgcc	cagccccctt	ggctgattat	taaagtgtat	ccttgagctg	76680
tagtaaat	taaccgtgaa	tataacagct	tttagtgagt	tttgtgagca	cttctagcaa	76740
attatcaaac	ctaaggatag	ccttggggac	ccctgaactt	gcagttggtg	tcagaaataa	76800
gggtgctcat	gtgtgtacca	tgccctctaa	ttttgtagtt	aattaaactt	cacaacttta	76860
ttattaccgc	ttacactcaa	tgtttattca	catttatcca	cataccactt	attctagtgc	76920
cttgcatcaa	agactttcta	tctcatgtac	tttattctgc	ttgaagttaa	tcctttagga	76980
tattcttttt	tttttttaaa	ccttgcacat	acataacttt	attttttatt	tatttttaat	77040
tttgttattt	ttgtgggtac	gtagtagata	tatgtattta	tgaggtacat	gagatgtttt	77100
gatacaggca	tgcaatgtga	aataagcaca	tcattggagaa	tggggtatcc	atcctctcaa	77160
gcaattttat	cttcaagtta	caaacaatcc	aattacactc	tttaagttaa	tttaaaatgt	77220
acattttaatt	ttgtattgac	tagagtcact	ctgttgtgct	atcaaatata	attttttttt	77280
tttttgagac	agagtctcac	tcagtggccc	agactgaaag	tgagtgagca	caagctcggc	77340
tcacttcaat	ctctgcctcc	ctgggttcaag	gcctcagcct	gcctcagcct	cccacatagc	77400
tggtgattaca	ggcacacacc	accatgcccc	gctaattttt	atattttttt	agtagagacg	77460
gggttttcgcc	atgttggcca	ggctgggtctt	gaactcctgg	cctcaaatga	tctgaccacc	77520
tcagcctccc	aaagtgtctag	gattacaggc	atgagccacc	acacctggcc	aaaatagaa	77580
attcttttagt	gaggtctgct	ggtgacaatt	ttttctttt	ttttgagact	gagtcctcgt	77640
gttgctcagct	tggtctggag	tgcaatagca	cgatctcagc	tcactgcaac	ctccacctcc	77700
cggattccag	caattctcct	gcctcagcct	cccaagtgc	tgagagatta	caggcaccca	77760
ccaccacacg	cggctaattt	ttgtattttt	agtagaaatg	gggttccacc	gtgttggtcca	77820
ggctggtctc	gaactcctga	cctcagggtga	tccaccacc	ttggcctccc	aaagtgtctg	77880

38/122

gattacaagc	atgagccacc	acgcacagcc	aattttttcc	gtttttgtct	gaaatcttat	77940
tttgtgtcat	ctttgaaata	tattttttgat	ggatataaaa	ttgtttggttg	atagttatta	78000
tcattattat	tattatttttg	agacaggggtc	tcactctgtt	gcctatgctg	gggtgtagta	78060
atgtgatctc	ggttcactgc	agacttgacc	tcctagggct	cagggtgatct	ccccacctca	78120
gcctccctag	tagctgggac	tacagatgca	tgccaccata	cccaactaat	ttttctattt	78180
tttgtagaga	tgaggctttg	ccacatttcc	caggctgggtc	tctaactcct	gagctctagc	78240
aatccaccca	ccttggcctt	acaaagtgtc	gggccatgac	tagccagcag	ttacttttta	78300
tagcatattg	aatattttaat	atgaatcttc	tggcatccac	tgtaactgtt	taaaaaatca	78360
gctgtttact	tggcactcct	tttttttttt	tttttttttg	gacagagtct	tgccctgtcg	78420
cccaggctgg	agtgacgtgg	cgtgatcttg	gctcactgca	agctctgcct	cccgggttca	78480
cgccattctc	ctgcctcagc	ctccggagta	gctgggacta	aaggcgcccg	ccaccacgcc	78540
cggtgatttt	ttttgtattt	ttcgtagagt	tgggggtttca	ccgtgttagc	caggatgggtc	78600
tcgatctcct	gacctcgtga	tctgtccgcc	tcggcctccc	aaagtgtctg	gattataggg	78660
gtgagccacc	gcgcccagcc	tctttttttt	tttttttttag	acggagtctt	actctgtcat	78720
ctaggctggg	gtacagtggtc	gtgatctcag	ctcagtgcaa	cctccacctc	ctgcctcagc	78780
ctgccaatat	gctgggatta	caggtgcgta	ccatcacgcc	cggctaattt	ttgtattttt	78840
agtagagatg	gggtttcacc	atgttagaca	ggctgggtctc	gaactcctgg	cctcaagtga	78900
tctgcctgcc	ccagcctccc	aaagattaca	ggcatgagcc	accgcacccg	gccaagttagc	78960
actcctttga	aggtaactcg	cttcccctac	ccttagcaat	ttttaacaat	ttttcttcat	79020
ttttatttcc	tgaagttttg	ttatttaataa	tctgtgtgca	gatttctttg	tatttctttt	79080
gtttgcagtt	catagtgatt	cttgaattag	tgtgttggtt	tctgttatca	ccacaggaaa	79140
attgtgagcc	gttagctttt	caaattatttc	cttgctaaat	tctctcttct	ccccttccgg	79200
tacaattgat	ttgattaaaa	ctaaaaccag	ggccgggtgc	agtgactcat	gcctgtaatc	79260
ccaacacttt	gagaggctga	ggcaggtgga	tcacctaaag	tcaggagtct	aagaccagcc	79320
tggccaatat	ggtgaaaccc	cgtctctact	aaaaatacaa	aaattaccag	gcattggtggc	79380
acacatttgt	agtcaggagg	ctgaggcagg	agaattgctt	gaatccagga	ggtggagggtt	79440
gcagtgagct	gagatccccc	cactgcagtc	tggcctgggc	gacagagtga	gatgagaatc	79500
tgtctcgaaa	aaaaaagtta	tgaatgtttg	ataaactata	tttgttagaa	tgtttgtgtg	79560
agaatactat	tcattgattt	ttaaacaatg	ttagattaaa	ccattcactg	gatttgtgat	79620
aattaaactta	ctgattttac	ctcactgatt	tgttgtaatt	aatacaactg	gtataaaaaa	79680
actgtgacga	ggccggggcat	ggtggctccc	gacctaaatc	ccagcacttt	gggaggctga	79740
ggcaggcgga	tcacctgagg	tcaggagttc	agaccagcc	tgaccaacat	ggtgaaaccc	79800
catctttact	aaaaatacaa	aattagccgg	tcgtgtgggt	gcattgcctgt	aatcccagct	79860
cttcgggagg	cttgggcagg	agaatcactt	gaacccggga	ggtggagggtt	gcagtgcagc	79920
gatatacgcg	cattggactc	cagcctgggc	aacaagagcg	aaactccgtc	taaaaaaaaa	79980
aaagaaaaaa	aacacataaa	acaaaacaac	actgtgacgg	ttcccaaaaa	ttaggagcat	80040
aattaaagga	actcctgata	aaaatttaatt	ttatcttaca	tgtaaactaa	aatgacttta	80100
tgaagttaat	tcagaaatac	aatgcagggt	attagtttgc	cacagctgcg	tattcagcct	80160
aatgtaatat	tcttgttatt	tttaaatctt	tcttttaact	ttactcatat	gtggatcate	80220
aaatttcaaa	agattaaatg	acaataactct	tagcagcaag	cttccctaag	catataaaca	80280
ttttaatggg	tgatgattca	gaagggtacc	gaagaatatg	tactgccaga	tatcattcac	80340
ccccatatac	ctgcccagaca	gacatcccat	tttgggaccc	tggataaatg	tgtgggtgga	80400
gagaaagata	ggagaaagtg	gtataagcaa	atggctttgg	agtctgattg	acagcgattg	80460
aaatcctgtc	tctacctctt	aacagcctca	tgatcctaca	taagttaacc	cgatcctcag	80520
ggccacatct	gtaaattggg	ggttgcgatg	gcagccatct	cacaggggtc	cttttcgggg	80580
aagggcagga	attatggatt	aagttagcta	gtaattgtaa	agcacttaat	acaaggaggg	80640
cgcataataa	gtacttcata	aataatgacg	gccattatca	tgactgagggt	gtatgcagct	80700
gtcgggggatt	acggcgactt	cagaatttct	ggtgggcagg	gctcaaaggc	agcaaatcac	80760
actggaagtc	gaggtgaggc	actgcttctg	cacagactgc	ttagctggag	agaatgagga	80820
aggcttagag	gagactttaga	ggaacttaga	gtcctccgcc	tccaactctg	tgggatctgc	80880
tccctgtgcca	gagacattca	ggggatttct	cgcaactctc	cctcccttac	gtccctcccg	80940
ccccatccaa	ctaaccacac	aacacataca	aaatagcccc	tgcgaggttc	tgcacgctgg	81000
aagggaacag	gagaagggcg	ctgcgctttc	ttgctgatgc	cctgtacttg	ggccctgggt	81060
agacacagcc	acttgtcccc	tcagcctgca	gagaaatccc	acgtagaccg	cgcccggggtc	81120
cttggcttca	gccaactctc	ctttgggtggg	ggtgggagtc	acgatccaag	gttttattgg	81180
ctacagacag	cggggtgtgg	tccgccaaga	acacagattg	gctcccaggg	gcatctcgga	81240
tccctgggtgg	ggcgccgctc	agcctcccgg	tgcaggcccg	gccgaggcca	ggagggaagcg	81300
gccagacccg	gtccattcgg	cgccagctca	cctcggagct	ccggagcctc	tgccagcgct	81360
ggttccgtcc	agtgccgctg	gacgcgctgt	cttctaactg	agaaaggctt	caccttgaaa	81420
tccaggcttc	atccctagtt	agcgtgtgac	cttgagcagt	tgactttatt	tttcagtgcc	81480

39/122

tagttttcca	gataccagga	ctgactccaa	ggactattac	tcatctggag	ggtttagcac	81540
agtaccgtcg	catagtaaat	ttccatgtca	gttttggtta	cctttcatgc	acttgcaaac	81600
atgccatgct	ctgaaacgaa	ataggcacat	cttttttttt	ttttttttta	aggagtcctc	81660
ctctcgccca	ggctggagtg	cagtggcgcg	atcttggttc	actgcaacct	ccacctcccg	81720
tgttcgagat	tctctgcct	cagcctcctg	attagctggg	actacaggca	tgccacgacg	81780
cccagttaat	ttttgtattt	ttagtagaga	cgggggttctg	ccatcttggc	caggctggtc	81840
taactcctga	cctcaggtga	tctgactgcc	tcagcctctc	aaagtgttgg	gattacaggc	81900
ataagccact	gcatctggcc	agaaatgaaa	taagtaaatc	ttttaacctg	ctctaacaat	81960
atagtgaaaa	gaccatatta	ttatttagagc	agggttaaggg	atttgcctat	tccgggttct	82020
agttatagtc	ttaaaacttg	acattcttgt	agaaagtaaa	aagtttcctc	ttcaaaagtc	82080
cccttcttgt	taaagaatac	atcataagtg	ttagaagtaa	tagtttattt	taaagactaa	82140
ctttcttcaa	gcctccttgc	tttgtgctaa	taactctttg	ttaagcccta	tcctatgtaa	82200
ctgttgga	tgctcacagg	cacgttccag	ttcacagcct	atgcccttc	cttatttggg	82260
aatgttattg	cttctttaa	cctttcggta	agcaacttcc	tctccttctt	cgttcttctt	82320
tgacttacc	tatttagaaa	gttttaggct	attagcaaat	cggctatcag	tttaagagtg	82380
tgaggtccc	ctccagccaa	ggatgcagg	acatagcagt	gaggacgacc	caaatgcgta	82440
agggataaat	atgtttgctt	ttcctttgtt	caggtgtgct	ctcgacatcg	ttccatctgc	82500
gattgagcac	cctttctgca	gaaagttaa	attgccttgc	tgagatctt	ttgtctccgt	82560
gctgactttt	cttcgtggca	ccgattatct	atttctaaca	attttggtat	ttctaactat	82620
ctgaacaatc	ttgggctagt	tgtctcttct	gggcctgttt	ccccatccgt	cacatgataa	82680
acttcatggg	tttaaaaacc	ccagcgaaca	tttattgagt	tactattacc	ttcctgcctt	82740
ccccaacccc	aacccagg	agcagttaca	acctcagccg	ctgagcgcac	tcgcccgggtg	82800
ttaagaagca	ccaaagacag	ggaggcttga	ttgattttgc	tttgggagta	gagggtcaga	82860
agattcacag	gaaaatggca	tttgagcaag	gatgattcac	tgagctagc	tttaaaatc	82920
tggcgaggct	tttatgttgc	agtcctttac	aaatgtgagc	attcgagg	actgcactcc	82980
gaaataagcc	cgcttccctt	tttcatctgc	taatgatcca	gggagctgct	ggttccgcat	83040
gcggcagggt	gtgccttttc	ctaatcagg	ttctgcatcg	cctcgaacct	gcaggccgtg	83100
gcgggttctc	ctgaggaagc	aggagctggg	gtgcagggtg	aagctgctcg	tgcccggcag	83160
cgcctgtgag	caaaactcaa	acggaggagc	aggaggggtc	gagctggagc	gtggcagggg	83220
tgaccttgcc	ttttagaagg	gcacaatttg	aaggggtacc	aggggcccga	agccggggac	83280
ctaaggcccg	ccccgttcca	gctgctggga	gggctcccgc	cccaggaggt	tagttttgca	83340
gagactgggt	ctgacgcgct	ccaccggggg	ccggcgacag	acgccacaaa	acagctgcag	83400
gaacggtggc	tcgctccagg	cacccagggc	ccgggaaaaga	ggcgccgggt	gcacgcgcgg	83460
gtcactgtgg	cgatgcgggc	gtgcgcccct	gcaccgcgg	gagggggatg	gggaaaaagg	83520
gcggggccgg	cgcttgacct	cccgtgaagc	ctagcgcggg	gaaggaccgg	aactccgggc	83580
gggcggcttg	ttgataatat	ggcggtgga	gctgcctggg	catcccagg	aggcggtggg	83640
gcccactccc	ggaagaagg	tcctttttcg	cgctagtcca	gcggcccctc	tggaaccgga	83700
agtcggggcc	gggtgtgtgaa	tgaggggagc	cgggccctcc	ccgcgccagt	ccccccgcac	83760
cctccgtccc	gaccggggcc	ccgccatgtc	cttcttccgg	cggaaaggta	gctgaggggg	83820
cgccggccgg	gagtcaggcc	gggcctcagg	ggcgccctcg	gggcaggtgg	gcctgcgagg	83880
gctttcccca	aggcgccagc	aaggccctca	tgggagggag	aaggtggcct	agatgcccc	83940
tgagtgcctt	gctctgctcc	gggactcttc	aagcgattgc	ttaaagccat	tcttgccgca	84000
ggctcagagga	gtattgtcgc	gctgggtcag	ggggtagttt	ttttgtgtt	tctttgagga	84060
gcctgtttgg	ttagaacag	ttcttaggtg	gaaccttatt	atggaagtct	gaagtttcca	84120
ccgtggatca	agatcaagga	aatctcttta	acgtgaaaaa	attgttttct	tcaccagtg	84180
aatgttgagg	gttttatgtc	tggggggagg	ggtagttact	gctgttacta	aaataaaatt	84240
ctgtcttcca	atcttctctt	aacaggaaga	ccactacttt	tgatgacttt	ggcaagtttg	84300
acttattgct	aaagtctccc	ttacaaacga	actacttaca	tttttgattt	ccagttgtat	84360
ctaactactg	gaaccctaac	agaaacagct	taattttgat	tctgggtaac	gttgttgac	84420
tacctgcccc	atgtttacgt	gaagtgcagc	agtaggggtc	tgtggacagc	agtgattttt	84480
ttcattaaaa	atacatatcc	cagataaaat	gtaccagaca	gaggccgggc	gcgggtggctc	84540
cctgtcaatt	cctgttgctt	ttgggaggct	tgccgggtgg	atcacctgag	atcgggagtt	84600
acgctgtgaa	tcctcagcact	tgagaaaacc	ccgtgtctac	taaaaataca	aaattagcca	84660
caagaccagc	ctgaccaaca	aatgccagct	acttgggagg	ctgaagcagg	agaatcgctt	84720
gggtgggtgg	gcatgcctgt	gcgggtgagc	gagatagcac	cattgcactc	cagcctgggc	84780
gaacctggga	aaactccgtc	tcaaaaaaaa	agtaccagac	agaaatgggt	tttgttttct	84840
aaaaagagcg	tgagacggag	tttcgctctt	gttgcccagg	ctcgagtcca	atggcgcgat	84900
ttttttgttt	ctcagtcctg	acctctgtct	ccaggtttaa	atcgattctc	ctgcctcagc	84960
ctcagtcctg	gctgggatta	cccatgcccc	accatgcccc	gctaattttt	gtatttttag	85020
ctcccaagta						85080

40/122

tagaaaacggg	gcttcacccat	gttagggctgg	tcttgaaccc	ctgacctcaa	gtgggcctcc	85140
cacctcggcc	tcccaaagt	ccaggattac	aggcatgagc	caccgcggcc	agccagaaat	85200
gggttttggg	aaaagcacta	aacaaaatcg	aacttggttt	catatgacag	ctctgctgct	85260
aactgtaaca	ggggcagacc	agttaaccta	cttttctgtc	ttctgtcagc	tgagaattag	85320
atgattccca	aagggccatt	gaactctgaa	tgactttaaa	tacttcttct	taagtgggta	85380
cacgggtttg	gtaactgatg	ccagggtgatg	aatgcatgaa	agtgcttaat	gaatgaaacc	85440
ggtaaaaatag	taggaggaag	ctttattggg	aaggcagggg	tatacctaata	agctctctaa	85500
tttattggta	ttgaagtggg	taacttttgt	ttttttaagg	ggggaaaaca	ttctaagaat	85560
aatgaggcaa	actgcatatt	gcacaagaga	ctgttgtctc	tattcaacaa	ataccttttg	85620
agtgtccaga	gtctgccagg	tgctgtgcta	ggccctcacg	attgagtagt	gaaccagaga	85680
atgtccctgc	acccatggag	cttattgtct	actggggtag	acagataata	aataagcaaa	85740
caaatcttct	ctcttctccc	tttcgctcca	tgtaagtgtg	tgtgtatagg	tgtatactta	85800
caagttagtg	aaagtgttat	gaaagattaa	gaggagaaat	gcattttggg	tagatgttag	85860
aggactcagc	aggtagacct	gaaacttaga	gctgaaggat	cagtaggagg	taactagaga	85920
ggccagggaa	tcgcatgttc	aaaggccagg	aggcaagaaa	gagcatgggt	cccttcaaga	85980
gaggaaagaa	ggctactgtg	actggagcat	agatgtaggc	aagtgttggg	tgattgagag	86040
ctctacgggc	catgggttagg	ttttattcct	aatgccgaga	tgccaaacat	gggtggtcat	86100
atctgtaatc	ccagtatttt	aggaggccga	ggcaggaata	tagcttgaac	ccaggagttc	86160
aagaccagcc	tgagcaacat	gagacctgta	caaaacattt	aaaaaattgc	tgggtatgat	86220
gggtcacacc	tgttggtccc	gctactcagg	aggctgaggc	agaaggatca	cttgagccta	86280
ggaggtggag	gctacaatga	gccatatttg	agtcactaca	ctccagcctg	gatgacaaag	86340
tgagaccatg	tgtcaaacaa	aatacagaaa	gaatattaat	ttaaaatttt	gaaagaggag	86400
tgatctgaac	ttatatctta	aaaagatcat	cttagggcat	gggtggctcat	gcctgtaatc	86460
aagggtcttg	ggaggctgag	acaggaggat	cacctgaggc	cagttcgaga	tcaacctgta	86520
cagcatagag	agactccatc	tctacaaaaa	gaaaaaataa	atagctgggt	gttgtgagtt	86580
attcaggagg	ctgaagcaga	aagatcactt	gagcccagga	gtttgaggct	gcagtaagct	86640
atgatccccc	cactgcaaca	cagttagatc	ttgtctcaaa	aaaaaaaaaa	aatcatctta	86700
gggtgctttt	ggaggctgga	tgtggttaaga	gtagaagctg	gagatgggtc	tggtagggtg	86760
tcgattcaga	ctttaaatag	catcaatgca	cttagtccca	aatttacatc	actacgttgg	86820
atccttgccc	ctgaatccag	actggtatat	ccaactttag	gttcagtttg	tatctctacc	86880
tgaccaatat	agagggtgtcc	agctttttgg	cttccctagg	ccacattgga	agaagaattg	86940
tcttgagcca	cacatagagt	acactaacgc	taacaatagc	agatgagcta	aaaaaaaaatc	87000
gcaaaactta	taatgtttta	agaaaagtta	cgaatttggt	ttgggcacat	tcagagccat	87060
cctgggcccgc	gggatggaga	agcttaatcc	agtagatacc	ttcaacttac	aatatctaaa	87120
attttatgcc	agattttagtc	attttaaac	tgctcatcag	tttttctcaa	gaagttagtat	87180
tttggtcttt	tttcttttct	tttttttgag	atggagtctc	gctcttatcg	ttcaagctgg	87240
agtgcagtgg	cggatcttgg	ctcactgcaa	cctccgcctc	ctgggttcaa	gtgattctcc	87300
tcgctcagcc	tcgcaagtag	ctggaattac	aggcatgcgc	caccatgacc	agctaatttt	87360
tggagacagg	gtttcaccat	gttggtcagg	ctggttttgt	actcctgacc	tcagggtgatc	87420
tgctctgctc	ggcctcccaa	aggctgggat	tacaggcatg	agccaccgct	cccggctgca	87480
tttttggatt	tttagttgct	cagcccaaaa	cttttagtaca	tctttgaacc	tcttctttcc	87540
tcctactcta	tatctgatcc	atcagcaaat	ctgttaggtc	tacctcacac	atatcgaaat	87600
cctaccacgt	ctcaccatct	gtgacaatta	acaccctggt	ctaggcagtc	atctctgtta	87660
agattgagtg	gttaaggatg	tcctctaagg	agatgacatt	caaactcttag	cttaaatgtc	87720
aagaggggagc	tggtttttata	aagattgagg	aggcagcatt	attttgccat	aggcttccat	87780
ttggtttcca	ttccattctt	gatacttatg	gtatatattc	aaaacaaatg	cacagaaaca	87840
gaccagagta	tattgggaat	ttcggtatata	gagttcctag	ttgggaaaag	atagactgat	87900
ctgtaaatga	tgctagtatt	ccatcatctg	gcaaaaaata	atctcctgcc	tcctctcata	87960
tatctcagat	caacagactt	tttctgttaa	gggcccatac	ataaatattt	taggctttcc	88020
agaccatatg	gtttctgtca	cactctcctt	tatccttgaa	gccatagaca	atatgtaaac	88080
aaatgggcat	ggctgtgcta	cgataaaact	ttacttacaa	aaactggtag	tgggccaggt	88140
taggcatggc	cagcactttg	ggaggctaag	gcagatggat	cacttggggg	caggagtgtg	88200
agaccagcct	ggccaacatg	gtgaaaccct	gtctctacta	aaaatacaaa	aaatagctgg	88260
gcatgggtgg	gggtgtctat	aattccagct	actctggagg	ctaagacaca	agaatcactt	88320
gaacccagga	ggcagaggtt	gcagttagct	gagatagcac	cactgcactc	cagccagggt	88380
cagcgagctc	taaagcaaaa	ggtagtgggg	tgtagttggc	tgtatttggc	ccatgggctg	88440
tagtttgcca	atccctgatg	cagaaacaaa	ttccaggtaa	ataagagcct	ggaatgttaa	88500
aaaaacaaaa	cttgaagtca	tgtagaagaa	caggttagggg	gaacaatcct	gatctcagga	88560
taggaaggga	tattgcttaa	aataagacac	aggaataat	aatccatgtt	gtgtaaattt	88620
gactacgtta	aaacttaaaa	ctttcgccaa	gcgcggtggc	tcacgcctgt	aataccagta	88680

41/122

ctttggggagg	ccgaggtgag	cagatcacca	ggtcaggaga	ttgagaccat	cctgggctaac	88740
acgggtgaaac	cccgtctcta	ctaaaaatac	aaaacattag	ccggggcgtgg	tggcggggcgc	88800
ctgtagtccc	agctacttgg	gaggctgagg	caggagaatg	gcctgaaccc	gggaggcgaa	88860
gcttgcaagt	agctgagatc	gcgccactgc	actccagcct	gggcgacaga	gtgagattcc	88920
gtctcaaaaa	aacaaaacaa	aacaaagcaa	aaaacctaata	actttcatat	aataaagtat	88980
acctaagata	cttctagaag	agaagattta	catccaggac	gtgtatggaa	tttctgcaag	89040
taataagtaa	aagacaaggg	acatgaagag	gcagttcaca	aaagagggaag	ccaaaaatgac	89100
caataaacat	gaaaggatgt	ttaacctcaa	aggaaacaag	gaaatgaatt	aaaaacatca	89160
aatgccattt	caaaactagt	aagttggcaa	aattaaaaat	accaaggatg	agaatatgaa	89220
gcatggctat	atgagtgcac	ggaatgggtac	agtcactttc	attaaaaatg	cacataattt	89280
gtttttttat	tatttttttg	agacagtcta	tgtcgccag	gctagaatgc	agtggcatga	89340
tctcggtcca	ccacaatctc	tgccctcctgg	gttcaagcaa	ttctcctgcc	tcagcctcct	89400
gagttagctgg	gattacaggc	acatgccaca	acgcccgggt	aagttttgta	tttttagtag	89460
agacagggtt	ttgccatgtt	ggccaggctg	gtctcgaact	cctgacctca	ggtgagctgc	89520
ttcccaaggt	gctgggatta	gaggcgtgag	ccaatgctcc	tggctgaaaa	aaatgcacat	89580
aattttgttac	ctagcaattc	catgtctaga	gctttatctc	agagaaaatc	ttgcttatat	89640
gcataggaag	acgtgtacta	gaatgttcac	tagttgaatg	tttaagtga	aattaggaaa	89700
taaagtaaat	gttcattaac	aggaataatga	gtaaagggtat	atttataaaa	caattaaagta	89760
gctaaaaatga	ataaaactaga	gctgcgtgaa	tgaactagaa	ctgggtcaat	agtcattgtca	89820
gattattgaa	tgaatacagg	tcagatatgt	atagagtgtc	atttgtgtaa	ttattttttt	89880
tttttttttt	gagatggagt	ctcactctgt	tgcccaggct	ggagtgcagt	ggcgtgatct	89940
cagctcactg	caacctccac	ctcctgggtt	aaagtgtatc	tcctgcctca	gcctcccgag	90000
tagttgggat	tacaggcatg	caccaccatg	cccagctcat	tttctatttt	ttagtggcca	90060
cagggtttca	ccatggtggc	caggctgggtc	ttgaactcct	gacctcaagt	gttccaccca	90120
acttggcctc	ccaaagtgc	aggattacag	gcgtgagcca	ccgtgctcag	ccatttgcgt	90180
gatttttaaa	gatgtgcaga	ataatgccat	taaaaaaaat	acacatacat	gtatatatat	90240
acacgtttgg	ctgggtgtgg	tggtccacac	ctgtaatccc	agcactttgg	gaggctgagg	90300
caggaggatc	acttgagccc	agggtgtacaa	gactagcctg	ggcgagatag	caagacccca	90360
tctcaacaac	agaaaggata	attaggtatg	gtggcatgag	aggatcactt	gagcccagga	90420
gttcgagtgt	tatcaggcca	ctgcactcta	gcctggacaa	caaagcaaga	ccgtgtctca	90480
aaaaaataaa	aataaaaaat	atttgtatgt	ggctcatagt	aaaaaacgta	catggaagga	90540
aaatgtcttt	atttattttat	ttattttttt	ttttttaaga	cagagtcttg	ctctgtcacc	90600
cagggtgggg	tacagtgggtg	taatctcagc	tcaccgcaat	ctcgccctcc	cgggttcaag	90660
cgattcttot	gcctcagcct	tctaagtagc	tgggactaca	ggtaccgcgc	accacacct	90720
gctaattctt	gtgttttcag	tagagacagg	gtttcaccat	gttggaagg	ctggtctcga	90780
actctgacc	ttaagtggagc	cacccgcctt	ggcctcccaa	agtcctggga	ttacagggtg	90840
gagccactgc	gcttggccag	gaaatatcta	atttagtaag	tatttatatc	tgggaaggga	90900
agggtcagg	ggtgattcat	aggaactcta	aagtctatgt	ataatactta	gggggacaga	90960
aggaataaaa	gcaaaatgct	gatattttgat	tgttgagtgt	tgtatatgtt	agaagtataa	91020
cataggagat	ctgattgata	gtaggagaat	gttttttaggt	ggtaaaagt	gaaccgtggt	91080
ggtttgtttt	ggcagtagaa	tcagtgtgtc	atagtttgta	tgtggaagg	aataaacaga	91140
ccatgttaag	gatgacttcc	ggaatttttg	tctgagtgt	gggtggatga	cagtgtcatt	91200
catgagggaa	gatgaagact	gaggtaggaa	caggtttggg	agaagatgac	atgttccctt	91260
ttagacaagt	ggaattatgg	aagatggcag	gtaggtggtt	agctatatga	atttgagata	91320
aaagatttag	gatggagata	taaattttagg	agtaacagcg	tatctatggt	attgtaagcc	91380
ttaagaatgg	gtaggatcag	ccaggaataa	cagatgtata	tgcagaagag	aggagtcaag	91440
gaagccaaga	caagttaatg	tttaaagtga	gtgatgtagt	ccatgggcag	atgctgctga	91500
gagggctgca	aacaccagtg	accctacaac	atttttaaat	gtcgtcttcc	tgacagcagt	91560
gatcagttacc	tgcaacgatc	ttattttatt	ttttcatggt	agtctccaca	cacttgaatg	91620
tagacttttt	gaaggcaaaa	tcattgcctt	ttctgagctg	ggagcatgtc	tggcacatac	91680
caagcactca	acagttgatg	tattgacttc	atccagatac	tctgagggcg	agttatttcc	91740
tgctactaga	ctttcacctt	tcaatgttta	agagcacaaa	tacagagatg	ggcacgtttt	91800
ggcattttct	attttgataa	ccttttctct	gtaagatttt	ttaatgttga	aaaaaaaaaa	91860
caagaaaaga	gggttaaaaa	tagtcttatg	tcagatcctg	tgatagaatt	cacacttggc	91920
ttaagctgct	gggcaccttc	ctatcttggg	tgcataatta	gcttatctac	agcagaattt	91980
ttactgtttt	atgtagtaag	gaagcaatta	tatgattatt	ttacagacaa	attattcttt	92040
atctttttat	tttttagacg	gagtcctctc	ttgtctccca	ggctggagta	cagtgtcgcg	92100
atctcggctc	actgcaacct	ccgcctcctg	ggttcaagca	attctctgcc	tcagcctccc	92160
aagtagctgg	gcttacagg	gtccgccacc	acacccagct	cattgttttg	tatttttagt	92220
agagatgggg	tttcaccatg	ttggccaggc	tggtcttgag	ctactgacct	cagggtgatcc	92280

42/122

accgccttg	gcatcccaaa	gtgctggaat	tacaggcgtg	agccaccgtg	cctggccag	92340
acaaattatt	atactctgag	tgtagaggc	ttaggatgtt	ttcacttgat	gctatgggag	92400
gaataagtaa	taagatatga	tacacaacca	aagacctttc	ttcactatgc	ttctagtagc	92460
tagtactatg	gatgacacat	ggtaataata	ttggtagca	ttgtccctca	atttactgtg	92520
ctagttactc	ttctaagccc	cttacaggta	tatatTTTTT	ttcatcaata	atcctctaag	92580
gtagttttta	ttattgacct	aattttataa	atcaagaaaa	ttaagaccca	gagaagtaa	92640
taacttggtc	aagatcacat	ggcttataag	tggttagagcc	agaatttgac	cccagatgtt	92700
gtgactacat	tgtctctcca	taagcagggt	caactctttt	gactggatgc	tggtccaagg	92760
tcacttcctt	agagaagcct	ttgtgacaa	ctaccctcct	gtgccctcct	ccaaggctgt	92820
ccattgttct	agaactttga	atactcatct	tagaataaa	ctggctcaat	ttttacagt	92880
ttatagaatg	gatctctgac	tgcaaaagt	ggctataatt	atctttttat	gttctagtga	92940
aaggcaaa	acaagagaag	acctcagatg	tgaagtccat	taaaggtaag	ttctgccctt	93000
ggcagtcac	tgcatataaa	agtgtgtg	ttgtctgtt	tgagttcttt	aatcctgtta	93060
tactctctct	tttggcatta	atcatttctg	ccttattttt	taattactta	tgattttgat	93120
ttatttccct	ctttaacctg	tataatgctt	taacatctag	catataataa	gtaggctttt	93180
ttttttttt	tttttttggg	gacggagtct	tgctctgtta	cccaggctgg	agtgcagtgg	93240
cgcgactctg	gctcactgca	agctctgtct	cccggttcca	caccattctc	ctgectcagc	93300
ctccccagca	gctgggacta	caggtgcacg	gcgccacgcc	tggttaattt	tttgtatttt	93360
ttagtagaga	cagagtttca	ccatgttagc	cagtatggtc	tcgatctcct	gacctgtgga	93420
tcgccccg	tcggcctccc	aaagtgtctg	gattacaagc	gtgagccacc	gcacccggcc	93480
gtaagtaggc	tttttttacc	ttaattttat	ttttttgaga	tgaggtcttg	ctcttatccc	93540
caggctggag	tgcatgggtg	ccatctcggc	tcactgcagc	atccacctcc	cgggttcaag	93600
cgattctcct	gcctcagcct	cccagtagc	tggtattaca	ggtggccgcc	accatgccc	93660
gctaattttt	gtatttttag	tagagacagg	gtttcaccgt	gttggccagg	ccagttctca	93720
actcctgacc	tcaagtgtac	cactcgctt	ggcctcccaa	agtcctggga	ttacaggcgt	93780
gagccaccat	gcctggccat	aagttaggct	ttactgagcc	ttgtgtgtat	tggtatcct	93840
agtgtattaca	gtgaaccagt	gcccttctta	ttaatcacac	atttaattgt	tcctaaaag	93900
tgattagtct	actttattta	tttagtaaga	caaaaaatga	agaatactct	taactgagca	93960
gtctgttaac	tgtaggaaag	cactgacact	tataaggctt	agttttctgt	catttatcca	94020
gaagtatggt	tgattacagt	ttttactttt	ttatttgaat	gaacaacctt	aattttaa	94080
atattttgtt	tattttttgt	tcggatcgat	acattgtcct	tgtttataga	ttagagcatg	94140
cttttttaa	atgctgtatt	actcactgat	tttattgtc	cagtgtacag	agattgaagt	94200
gggaaaatta	taattggaa	tgtttccata	gtcattacat	attaatttca	tcaatttatt	94260
tcataaaaat	ctgtagattg	ctacttattt	agatttttcc	ttcaaatgtt	tttatgtgt	94320
attgcttgca	ctgagtattt	attctatatg	ctcaatttgc	tggaagaaga	gactaatat	94380
aacttaggca	agttgtaaaa	ttagggaaaa	aagtaaggta	ccttacagcc	tagtttactt	94440
atttcttatg	taaaagccag	tagattccac	attagttcaa	actgccttct	ttgagcaaaa	94500
cttgattggc	agtgtataag	gcttaaagcc	cttctcaagc	agagacctgt	aaagactaga	94560
tctgactgta	gtagaaggaa	ggaacttaga	tgtttcaggc	agtgtagaaca	ccagttctcc	94620
actctaaact	ttgccactaa	cagtatgacc	ttgggaagtt	gtaactttct	tcagattctt	94680
catttgttga	atggggggat	tggtctagct	aatttctaaa	tctctactgg	gctaaaaaat	94740
tctgtgctta	tactctgatt	atgaagtaca	taatctgtgc	ttacatttca	ctgacttatc	94800
cttaggataa	tacagaagca	gtacaagaaa	cagccctcca	agatgtttgc	agtctgggta	94860
gaaagacaaa	cttatacaca	gaacagtagc	aaatagacca	aaataataat	agctgccatt	94920
tatagaacac	ttcttctgtt	ctgggcatta	gacaaaaact	gactataacg	gtgaacaaaa	94980
aagacttagg	tcctgcccct	attgaactta	cagatttagta	ggggagagga	acattaatca	95040
agtaattcca	cagatggctt	agcctagatt	ggtagtgatg	gaagtaaaga	gatgtgaacg	95100
gacttgaaaa	aaaattcgga	ggcaaaatgg	atagaagttt	attattgatt	aaatagagg	95160
tgtgagagag	agggatattt	aagattgata	cctaccttct	ggcttgcccta	acagaaccaa	95220
aacaggaaat	tatatgttca	gttttgttat	gttgggtggg	aggtgctttt	gagtcattca	95280
tttatatatg	ttatatatgt	tatttttatat	gcatagtaat	tttaaggctt	gagtttttaa	95340
ccaaagggtta	gagagtgatt	tttttagagtc	tagcaaacct	aagttgaaat	cctgcctggt	95400
gaaatggctg	tttactagct	cattaacctta	gggcaaaagta	ttcaacttgt	tttcattttt	95460
gtcttcatct	ctaaaatgag	gaaaatatgg	tcttacaaga	ttgtccctgag	agatagatga	95520
aataatatcc	aaaaaa	aaggtacata	gagaaaactcg	tatagtgcct	ggtatatagt	95580
aggtcctcca	ttggtagcta	tcattatcta	gttttaacat	agccttcagt	ttgttgaatt	95640
agtcaactct	agtgaaagc	tgcaaggaat	tcagaggaat	ttgagatcaa	caaatgattt	95700
ctgaagttaa	gggaagactt	catggcaatg	acacttacct	tgtataaaag	ttgaagaata	95760
agaaagattt	gaatgagaga	ttctttctct	tctccctacc	agccagctt	cttatttgag	95820
gatatatgtg	gcaaaagggc	cttcagacaa	gtagagggag	atttttacag	aaagattgag	95880

43/122

atgaagggtat	agaaggctgt	aaagaccaga	aaagagaatt	gagacagagg	aagcaggaag	95940
ccactgtagg	tttttgagca	agatatgtat	gctgtaagta	tgggtgtttat	gaaagggttag	96000
tctggaagag	atttgcagga	tggagacccc	ggaagttttt	ttgttataat	acagaaagac	96060
ttgcactgag	ggtgaggtgt	taaaaataaa	caggtaagta	aatgttttaa	catcttgaag	96120
gaaaagtcaa	caaatcttgg	caagtaaaca	gataacagtg	aaaaagaatg	ggaccaagat	96180
tttgagtttt	ggagactggg	ggattgaaca	gacagggaaa	ttgagaggag	aatcagatga	96240
tgatgtttta	agttgatatt	tagacagatt	gtgcttgaga	tggtaaaagtc	aatgtgggtg	96300
ggaatgctta	gtagcgagta	atcagtgata	caagaccaa	gccaggtca	aagacaagtc	96360
acagatacag	atcagggtct	tttcatctgc	tccacagagg	tgtaccctag	gagctgttgc	96420
aaacagtcca	tgtggagggt	gtgagtaaga	tgtttccctt	gaatttgcca	gaattacttt	96480
tttgtgtgtg	ttgtgttttt	ttctgagaca	gattctcgct	ctgttgccca	ggctggaggg	96540
cagtggcgag	atcgcgcagc	tcactgcaac	ctctgcctct	cgggttcgag	tgattctcct	96600
gcctcagcct	cccaagtagc	tgggattaca	ggcttgtgcc	accaagccca	gctaatttct	96660
tttgtatttt	tagtagagat	gggttttcac	catgttgccc	agactggtct	cgaactcctg	96720
gcctcgtgat	ctgcctgcct	cagcctccaa	aagttctggg	attacaggcg	tgaaccactg	96780
acaaatgagt	cttgttaagt	ttattttggg	gggaagcaaa	ggaggtttca	gcttttaaaa	96840
agtttgaaaa	ttattgctct	ggtaataatt	aaagatttga	gagtaaata	gctttctagc	96900
agaaagaata	aaagaagaac	agatagcctc	aagaagggga	gccaaagaag	caggctatat	96960
ctgacacact	gggtgttgat	aaatgggtat	taaaagaatg	agagcaatga	gcagatagaa	97020
gaggaaatta	ggagagtata	ataccatgga	gaccaagaaa	gatagactat	caggaaggag	97080
tggtaaaaat	aagttactag	ttctaagaga	gatgttaaga	gggaccgggg	aaagccttgt	97140
acaaatgagt	tagtagcatt	ttacattata	tacatctaat	taagaaacaa	tgcgagagtc	97200
tcaccattcc	tatagactct	tacttgtact	tgtctgaaca	cgaaaactgg	cttttgttta	97260
taataaagct	aaaaattatt	ttgtctcaat	ttctcatgaa	aataaaaaa	aaccttcttt	97320
taacattgaa	aaaaatggtt	gaagacagtc	actcttcatt	ttgtaattcc	cacaactatt	97380
attgaatgac	tgaaattatc	tttattctga	agccaaaggg	gtgatactga	tatttcttca	97440
gactactaaa	aatatatttt	atgaattttt	agtgtgcttt	atcttttttt	gttttttttt	97500
ttgagatgga	gtttcactcc	cgttgctcag	gctggagggc	agtggtgcaa	tctcagctca	97560
ctgcaacctt	cgctcccag	attcaagcaa	ttctcctgcc	tcggctctccc	aagtagctgg	97620
gattacaggc	acctgcccc	acacccagct	aattttttgt	attttttagta	gagacagggt	97680
ttcaccatgt	tggtcagggt	ggtcttgaac	tctgacctc	aggtgatcca	cccaccttgg	97740
cctcccaaag	tactgcgatt	gcaggcatga	gccaccatgc	ctggcctgag	gaatattttt	97800
ctaggttccc	cccaccccaa	gcattttatc	tgcaatttta	gttttgttcc	taaagcaagc	97860
aaggtttaag	gatttaaaaa	taatccgtat	tttagaatgc	tttctggctt	tgttactttt	97920
tatccacagt	agaagttctc	agagaatgat	ctccctcttt	taatttaact	ttttggcaca	97980
gtatttttag	aattataaat	aatattagaa	tgttttctgg	ctgggtgtgg	tggctcatgc	98040
ctgtaatcct	ggctacttgg	gaggctgagg	cagggaatc	acttgaacat	gggaggcaga	98100
gggtgcagtg	agccgagggtc	atgccactgc	actccagcct	gggtgacaga	gcaagactct	98160
gtctgggaaa	aaaaaaaaaa	aaaaaaaaag	tgttttcttt	cctattttcc	accacttgat	98220
taagttactt	ttctctttaa	gtattttttg	ctgagtatgc	tgacttaaga	gtaattgttac	98280
aaaatttaat	ttttaaagtt	ctctgaaagc	ccctttatga	gagttttagg	ctatcaaatt	98340
gtgtttaatt	cttaacaatt	ttttgaaaaa	ttatagcttc	aatatccgta	catccccac	98400
aaaaaagcac	taaaaatcat	gccttgctgg	aggctgcagg	accaagtcac	gttgcaatca	98460
atgccatttc	tgccaacatg	gactcctttt	caagtagcag	gacagccaca	cttaagaagc	98520
agccaagcca	catggaggcc	gctcattttg	gtgacctggg	taagtaacta	tcatttttta	98580
tttaacttga	ttagaaggat	ttgagtacaa	tacttgaaac	ttctgtcata	ggatacagaa	98640
ctatataatt	ggaaagtgtc	ttggaaaaaa	tgtatttaaa	ataacagcta	caagtataat	98700
gggtagctgt	gttgtgttcc	tgtaaatata	gaatataaag	catgccagct	agaaaaacaa	98760
gcattttccag	aagaaatata	tctgatcact	aaatataaat	atatgaaaaa	gatgtctcac	98820
tttattactg	agggaagtgc	aaattaaaa	aatcagttaa	tgttctccta	acacattagc	98880
atatttttta	aagtttgaca	atttgaatgt	cagtgaagat	gcagggaaa	acccctccta	98940
tttagtgata	atataatctg	gtgaagactc	tttggaagc	aatttggaaa	tcagtataaa	99000
atatgcatgt	catttaggcc	actctttcta	agacctagcc	ctcagatatg	ctcattcata	99060
tgtgcagggt	tgtatgtgtg	tgtgtgtgtg	tgtgtgtgtg	tgtatatgta	tgtatgtatg	99120
tatgtatgta	aggctattca	tttagtattt	tttagtattt	gtttgtgata	gcaaaaaatt	99180
atggacaaca	tataaatatc	tgttataggg	aaataaccaa	attgtgggtat	acgcatgctc	99240
tggagataaa	tatagccatt	tgtttctatt	tatttatttt	cttgagacag	ggttttactc	99300
tgttggccag	ctggagtgcc	agtggatgta	tacttggttca	ctgcagcctt	cacctcctgg	99360
gcacaagcca	ttctctcgcc	tcagcctcca	gagttactag	gactgcaggc	atgtgtcacc	99420
acacccagat	aatttttttaa	ttttttgtag	agacagggtc	tcactatggt	gcctaagctg	99480

44/122

gtctcaaaact	cctggcctca	agcaattctc	ccacacagge	ctcccaaagt	gctgggatta	99540
ccaacgtgaa	ccaccacacc	tgggttcagtg	tagccattta	gaaatctaaa	aaagacgtgg	99600
gaaaatgtct	aaggcatgtt	taaatgtgag	aaaagcaagt	cacagtatgc	atggtaaaat	99660
ccgttatatt	aaaataagtt	cttccaaaac	aaaaacatat	gcaggagacc	tttattttgt	99720
cagtattttct	tacccaaatt	tctgcactta	gaaaattgca	tgtcatgttg	tcataagttg	99780
aaaaaaagat	ccatgaacca	atggacttct	aataaaaatca	gtcctgcttt	tgacatctct	99840
ctctactttt	gtgtatatct	aaaccagagt	gtcaatgtgt	ttgtggggca	cacttagcaa	99900
taatacatag	cagacaaaat	gcataatagct	cagagagtaa	aattgtaagt	tttgctagat	99960
cactcataaa	ttgctgatga	gaatttaaaa	tgggtgcagat	gctctggaaa	acaggcagtt	100020
tctttctttc	tttttttttt	tctttttgag	acagggtctc	actctgttgc	gcaggctgga	100080
gtacagtggc	gtgattacaa	ctcactgcag	cctcaccctc	ctcagggttc	ggtgatcctc	100140
cctcagttct	ctgagttagct	gggactatag	gcatgcacca	ccacgcctgg	ctaatttttg	100200
tatttttttt	tttttttttt	ctagagacgg	ggtttcgcca	tgtttcccg	gctggtctca	100260
aactcctgga	atcaagcgat	ccacttgctg	aggcctccca	aagtgcctgg	attacgggag	100320
tgagctactg	tgccctggcct	aggcagtttg	tttgtttgtt	tggtttgttg	tttatttatt	100380
tgtagacgga	gtgtcacagg	ctggagtgca	tggtggccaa	ttttggctca	ctgcaacctc	100440
cgccctccag	gttcaagcta	ttctcctgcc	tcagcctcct	gagtagctgg	gatgacaggt	100500
gcctgccata	atgcctggct	gatttttgta	tatttttagt	atatgggggt	tcaccatgtt	100560
ggtcaggctg	ttgttgaaat	cctgacctca	ggtgatcagc	ccgcctcgcc	ctcccaaagt	100620
gctgggatta	caggcatgag	ccgtcatccc	tggttggttg	tttcttatga	cgtgaaacat	100680
gcaattacca	tatgacctag	cagttgcact	ctgtatttat	cccagataaa	tgaaaactta	100740
ccttccaata	aaaacctgtg	cacaaatgtt	catagcagct	taatatgtga	aaactggatg	100800
ttcttcagca	ggtgaatgaa	ctgggttcatt	cataccatgg	aataccattc	agcaataaaa	100860
aggaacaaac	tggtgatata	tttaaccacc	tggatgaata	tcaagggaat	tatgctgtca	100920
gacaaaaaac	agtcctctaa	gactacatat	agtatgtatt	cggttggtga	atattcttga	100980
aatagagaaa	ttaagagaaa	tgaaaagatt	agtgtttgcc	agatgttaga	gacagggagg	101040
tgagaggggt	aagtgggtgt	agttataaaa	gtgcaacatg	agggatcttt	gtgatgttga	101100
agttgtatct	tggcagtgga	tcagaaaatc	caaagtgtat	aaaattacaa	agaactaaaa	101160
acaagaatga	gtatagataa	aactggggaa	atctgaacaa	gttagagtgt	tgtatcactg	101220
tcagtatctt	agagtgatata	tgtactatag	ctttgcaaga	tgttaccatg	ggagaaaacta	101280
aagtgtacaa	gggatctcta	ggtattatta	tttttttaga	gatgggggtt	cactatgttc	101340
cccaggccgg	tcttgaactc	ctgggctcta	gtgatccgcc	tgccccagcc	tcctaaagta	101400
ctggaattac	aggcgtgagc	gacctatgct	ggccctttca	gtattgtatc	ttagaacttc	101460
atgtgaaatc	agcattatct	catagaattt	aatttaaaaga	aattgtaaac	ctcacagaag	101520
atcagaattt	cctcaagttt	gtgatgttga	caaagatgaa	ctagttgaca	ctgacagtaa	101580
gactgaggat	gaagacacga	cgtgcttcaa	aaaaatgatt	tgaatatcaa	tggatttaaga	101640
agaactcttt	tgacaaattg	atgaaaccct	cagtcagttt	tataagaatg	cccatcttta	101700
tgatcatgct	atgaaagcca	attttttaaa	aaattttttg	tctttcctaa	caattagctt	101760
gtggttatata	tttaaattta	gttaaatata	agataaatga	ttttttatta	agtttagttt	101820
cattttttcaa	ggtacgatct	caaagctact	ctttaacccta	ctatgaatga	ataatgctga	101880
gttcataaca	tctttgtaga	tatatccaca	attttccctc	aggataaagt	cctacaagtg	101940
gaattactgg	actgaaaata	atgcagtttg	ctaagacttt	gctatctggt	cctgaatgct	102000
cctccaaaaa	ggttttgcca	gtttacatcc	tcatgaccag	cgaatgagag	tggtgcctat	102060
tttctgtgct	ccttggttact	gcttaataat	ttttgaaaaa	aatctaattt	gacagacaaa	102120
aatgcatttt	atggttaattt	gcttttctgg	gatttttaat	gaggttgagt	atagttttta	102180
atatttttat	tggccctctt	ggaactagta	tcataagttt	tttttcttaa	gaatttatgt	102240
agtcctgggt	gggcgcagtg	gctcacgcct	gcaatcccag	cactttggga	ggccgagggtg	102300
ggtggattgc	cgaaggctcag	gagtttgaga	ccatcctgac	caacatgggt	aaaccgaatc	102360
tctactaaaa	gtacaaaaac	tagctcagcg	tggtggcggt	tgctgttaat	cccagctact	102420
taggaggctg	agtcaagaga	atcgcttgaa	cccgggagggt	ggagggttgt	tgcatgtgagc	102480
cgagatcgcg	ccattgctct	ccagcctagg	caacaagagt	gaaaagtctc	aaaaaaaaaa	102540
aaaaaaaaaa	aaaaaagaat	ttacatggct	tgaattgcca	ttaaaagaga	tatgagaatt	102600
attgagtaac	aaataacttt	ttataaattt	aggcaagttt	tggacgattg	tactttgttt	102660
agaaacccaa	agcatagtat	ttgtagtttt	tttatttact	ttagtgtgta	ggaagtaaac	102720
tttattcaag	gtctctggta	ccagtgtgtg	ctaaaagtga	ttgactaatc	tgctcaatctg	102780
aaattatttg	ttgctgaact	gctaattctt	ttgcttctat	cttttaggca	gatcttgtct	102840
ggactaccag	actcaagaga	ccaaatcaag	cctttctaag	acccttgaac	aagtcttgca	102900
cgacactatt	gtcctccctt	acttcattca	attcatggaa	cttcggcgaa	tggagcattt	102960
ggtgaaattt	tgggttagagg	ctgaaagttt	tcattcaaca	acttggtcgc	gaataagagc	103020
acacagtcta	aacacagtga	agcagagctc	actggctgag	cctgtctctc	catctaaaaa	103080

45/122

gcatgaaact	acagcgtcctt	ttttaactga	ttctcttgat	aagagattgg	aggattctgg	103140
ctcagcacag	ttgtttatga	ctcattcaga	aggaattgac	ctgaataata	gaactaacag	103200
cactcagaat	cacttgctgc	tttcccagga	atgtgacagt	gccccattctc	tccgtcttga	103260
aatggccaga	gcaggaactc	accaagtttc	catggaaacc	caagaatctt	cctctacact	103320
tacagtagcc	agtagaaata	gtcccgttc	tccactaaaa	gaattgtcag	gaaaactaat	103380
gaaaagtga	tatgtgattt	tcttgtgtgt	acatatgtgt	ctcactttct	ttttttaatt	103440
tactaagcag	aacttcagat	gaggaataaa	atgattggaa	tatttttttt	ctcctctaac	103500
tacttgtaaa	tttgggagaa	tttggagagt	gtagtagagt	cagatcagtg	tatggaaaag	103560
gagcaggagt	gactggacct	tctaagaagt	gtgttatcag	aattagtaaa	tgaagggtca	103620
aatgtcctac	ttttcccctc	cactgatatt	gacatcaaac	cattatccac	atagccttat	103680
ttcctccctc	ggtcttaatt	ttattaatat	tttactgcac	tttgcagata	aaatttttaa	103740
aaaattttta	aaaattgcca	ataagtgaac	tttattaaagt	tcagtgtcta	gtgtatatatt	103800
ggattttatt	tattagtac	aagacctttg	tgcaggtagt	aggcatgatt	atcttttttt	103860
ttttgagatg	gagtcttgct	ctgtcgccca	ggctggagtg	caatggcgcg	gtctcggctc	103920
actgcaacct	ccgggttcat	gccattctcc	tgctctagcc	tcccaaataag	ctgggactac	103980
aggcgccctg	caccacacc	ggctaatttt	ttttgatatt	tagtagagac	gggggtttcac	104040
catgttcgcc	aggatggctc	cgatctcctg	actttgtgat	ccgcctgcct	cggcctccca	104100
aagtgtctgg	attacaggca	tgagccaccg	cgcccgagct	gattatctta	tttacacatg	104160
agaaaaaccg	ggcttagaaa	ggttaggtaa	cttctcttag	gttgtagagt	aaatgtggac	104220
ctagaagcat	tttgacaaga	gcacctgttt	ttttttcttc	tctattagtt	tagaaattat	104280
atactcttaa	ttatcacctg	ggattttgat	tagacagcct	tcagtgtcct	tttcatctta	104340
aatgttcttt	gtgtcttaaa	gggctaagtg	attttctcag	atcttttagt	tcactcattc	104400
tcagtgaact	aaaatgaggt	ctaactctgt	actgaatcaa	gttttcagca	tgttatttcc	104460
ttcctccctc	cctccctcct	tccttccctc	aaccaggctc	ccgaggagct	gggattacag	104520
cgcccccgca	ccactccttg	ctaattttta	tatttttagta	gagacggggt	ttcaccatgt	104580
tggtcaggct	gatcttgaac	tcctgacctc	aagtgaacca	cctgcctcgg	cctcccaaag	104640
tgctgggatt	acaggcatga	atcacacac	ctgacggcat	gttattttca	tcgcaaatgt	104700
actgttaagt	gggagaagtg	gcacacactt	gtactcccag	ctactcagga	agcttaaggt	104760
gagaagattg	cttgagccca	ggagttttga	gaccaacctg	ggcaacacag	caagacccca	104820
gctcaaacaa	agaaaaaaag	ttattgaatt	ttttatttct	atggatcatt	ttttgtagtt	104880
tcttattcct	ttcacccttc	attccactct	ttgatcccat	cttttattta	tttagtttta	104940
ttaaatgtat	atttgtctga	taattctgct	atctacagtt	ttttgtggac	ctgactcagc	105000
atttctttgt	ttcttcggat	tcagactggt	gggtggttgt	gatttttagtg	atttttggcg	105060
gtgaacatgt	ttcttgagct	tttgtctgtg	ggaattctct	gtgtactctg	tataaattaa	105120
gttacttcag	gtgttttgca	ttttcttttg	ccatgcacct	ggggcctggg	tcactaccct	105180
tctgggtacca	cttaaaactg	aattttttgt	ttgggtgctc	gtactgatcc	tgtatgagta	105240
caggtttata	cttactgtag	aaatatgggt	tttgattatg	gggtattgtc	ccagatgggtg	105300
ctggagattt	aatatgctct	ctgttaaact	taatgtgttg	tccctgtaaa	actccaaaat	105360
tctgaattcc	agaatactac	tgccccaaaa	tgtttaagat	aagggcactg	cctgtatttg	105420
tttctgcctc	ccactatttt	ccttagttta	acacaaaactc	acctttttta	aaaacatttt	105480
gagagaattc	agtattggga	agagtttcta	acctgtttct	ggaaatggaa	gtccaaagtc	105540
tgtttctgta	attgtttttt	ttttgagatg	gagtctcact	ctgtcaccca	ggctggagtg	105600
caatgacgta	ctctcagctc	actgcaacct	ccacctcccg	ggttcaagcg	attctcttgc	105660
ctcagccccc	tgagttagctg	ggattacagg	tgcccaccac	catgcctggc	tgatttttgt	105720
atttttagaa	gagatggggt	ttcgccatgt	tgccaggct	ggtcttgaa	tcctgacttt	105780
gtgatctgcc	cacctcagcc	tcccaaagtg	ctaggattat	gtttctgtaa	ttgtaataca	105840
tttattgttt	ttagaaactg	tctttgcttt	agtggtaatt	ttcaataaaa	atagaaatag	105900
cagtggagtt	attaaaagag	cattagttac	atttttccct	ttttcattat	cttcaaatat	105960
tatatatagt	aagtttgacc	tttttaaaat	gtatacttgt	atcagtttta	acacatacat	106020
agattcctgt	aactgtcacc	actataaggg	taaagaacag	ttagttcctt	cacctttgaa	106080
gtcaagcccc	acctctatcc	caacacttgg	caaccgctga	tctttctccg	tctcaatagc	106140
tttctgtttt	ctcttttttt	ttcttatttt	tttttttgag	acagcgtctt	gctctgtcgc	106200
ccgagctgga	gtgcagtga	gcaatctcgg	ctcactgcaa	cctccgcctc	ctgggttcaa	106260
gcagttctcc	tgccctagcc	tccctagtag	ctgggattat	aggcacgcac	caccacacc	106320
ggctgatttt	tttgtatttt	tagtagaaat	gggttttcac	catgttgccc	aggctggtct	106380
caaacctctg	acctcaagtg	atccacctgc	ctcgccctcc	caaagtgtctg	ggattacagg	106440
cgtgagccac	tgtgccaat	caggactttt	tttttttaaa	tttacattca	acttgtcatt	106500
ttttcttgt	atggattgtg	ccttcagagt	cacacctaaag	agccctttgc	ctaagcaaa	106560
gtcatgaaga	ttttctcata	tgtttccctt	taaaagtatt	gtggttgccc	agggtgccatg	106620
gcttatgcct	gtaatctcag	cactttgaga	agctgagggtg	ggcagattac	gaggtcagga	106680

46/122

gatcgagacc	atcctggcta	atgcggtgaa	accccatctc	tactaaaaat	acaaaaaaa	106740
aaaaaaatta	gccgggctg	gtggcgggca	cctgtagtcc	cagctacttg	agagggttag	106800
gcaggagaat	agtgtgaacc	cgggaggtgg	agcttgagct	gagccgagat	cgcgccactg	106860
cactccagcc	tgggcaacac	agtgagactc	catctcaaaa	aaaaaaaaaa	agtattatgg	106920
ttttacactt	tacgtttaga	tatatatctt	ttttgagtta	atgtcgtata	agtatgaggg	106980
ttacgtcaga	ttttttgttt	tttgtttatt	ttttacatat	gatgtctagt	tggttctaata	107040
ccattttgtg	aaaagacaac	ctttactcca	ttgaattgcc	tttgtacttt	tgccatatatt	107100
gtctaggcct	gtttttggac	tcctttttct	gtttcatgat	gtgtgtgtct	attcctttgt	107160
taataccaca	tggtcttaat	tactgtatag	taagtcttaa	aattgggtaa	tgctggcctt	107220
ataaaacgaa	ttgggaagtt	tttattttta	ctottatttc	cattttctag	aagagattgt	107280
gtagaattgg	tgctatttct	tccttagata	tttgggtgaa	ttgggaagtg	atgccatctg	107340
ggcctagggt	tttgtttttt	gtgtgtgaga	cagagcttca	cttctgtcac	ccaggttgga	107400
gtgcagtggg	gagatcttgg	cttactgcaa	cctctgcctc	ccaggttcaa	gttatcctcc	107460
tgccctagcc	tcccaaatag	ctgggattac	aagcgtgtgc	caccatgccc	gactaatttt	107520
tgtaattttta	atgcagacag	ggtttcacca	tgtagccaa	gctgggtctcg	aacttgtgac	107580
ctcaagtgtt	tagccaccct	tgccctccca	aagtgttagg	attatagatg	tgagccaccg	107640
tgccctggcag	gggcctaggg	ttttcttttt	cagagtattt	taaactatga	attcagatta	107700
tttaatatag	atagagactat	ttaagttatc	tggttcttct	tgagtgaatt	tttactgtag	107760
tttatggcct	tttagtaatt	aattgtattg	aattgtcaaa	tttatgagcg	tgtaattatt	107820
tatagcattt	cgggtttgta	gtggtatccc	tccttttatt	ctgggtgttg	caatttgtgc	107880
ttgtttttct	tgttcagatt	gtatagggat	ttattagtct	tttcaaagaa	ctagcttttg	107940
ttttgatttt	tctgttgttt	tgttttcaat	tttattgatt	ttctgctctt	tattatttct	108000
tttctattat	ttctgcttgc	tttgggttta	ttttactctt	ttttttttct	ccaagttgct	108060
taaagttagaa	acttagattt	ctgggtttgag	acctttcttt	tctaagataa	gcattttaata	108120
ctgtaaattt	ccttctaacc	actgctttag	ttacaccccc	acaaattctg	gtattttgaa	108180
ctgagcacaa	atgaaatgtt	ctaatttccc	ttgaatctta	ttcttttacc	aatgaattat	108240
ttagaaatat	gttatttagt	ttgcaagcaa	ttggagactt	ttttcctgtt	attttctcac	108300
catttatctt	tcatttcaat	atattatggg	cagagaatat	attttgaatg	atttcattta	108360
tttaattttta	aaaataacat	taaaaaattt	tttaaaatgt	gaatatacca	catacagtat	108420
aaagattgta	cattctgttt	ttggacagtt	ttctataaat	gtcaagtga	tttagttggg	108480
taatgatggg	gttcagtttt	tcctttattct	tgctgtactt	ttgtatgcag	ttatatcact	108540
ttattactca	gaagagtgtt	gaactttcca	actacaattt	ttttttccaa	ttttactttc	108600
agctctatct	gggttttgc	catgtatttt	gaggtctctg	tgtaggtgtg	gtacacattc	108660
aggatgatatt	cttctgggtg	tttatcatta	tttatcatta	tgtaattccc	tccttatggc	108720
aattttccct	gttctaagat	cagaaatatc	tggtgtccaa	tttatataga	cactgcagct	108780
ttcatttgat	tagtgcttgc	atggcatatc	tttttccatt	tttttacttt	tgatctacct	108840
ttataattct	atttaagggg	ggcttcttgt	aggcagcata	tagttgggta	gtgttattta	108900
tttattttatt	tattttattt	tttattttatt	tatttgagaca	gagttttgct	cttgttgccc	108960
aagctggagt	gcagtgggtg	aatcctggct	taccacaacc	tcacacctct	gggttgccag	109020
gatttctcct	cctcagcctc	ccaagttagct	gggatttacag	gcacgcgcac	catgcctggc	109080
tgattttttg	tatttttagt	agaaacggat	tttcaccatg	ttagccaggc	tcgtcttgaa	109140
ctcctgacct	caggtgatcc	acctgctttg	gcctcccaaa	gtgctgggat	tacaggcgtg	109200
agccactgca	cccggctgag	tcattgttatt	tttaattctt	tctcacaata	cagggttttt	109260
gttggttaaat	tttaattattt	taataataaat	tttagtataa	ttattttacat	taaatgtaac	109320
tggtgactg	gggtattttat	aatgtgtaaa	tataattatt	gggtattaata	taatttatatt	109380
actcataata	atattaatat	ctttggattt	agattaccag	tttagtataat	gtttttctgt	109440
ttctccctct	ttgatttccc	cttttttgct	tttttttttt	ttttaattctt	tatttttttt	109500
tagtattttg	tgatcattct	tgggtgtttc	ttggagaggg	ggatttgcca	gggtcatagg	109560
acaatagtgt	agggaagggt	agcagataaa	catgtgaaca	aggtctctgg	ttttcctaga	109620
cagaggaccc	tgcgcccttc	tgcatgtttt	gtgtccctgg	gtacttgaga	ttagggagtg	109680
gtgatgactc	ttaacgagca	tgctgccttc	aagcatctgt	ttacaaaagc	acatcttgca	109740
ccacccttaa	tccatttaac	cctgagtggt	aatgacacat	gtttcagaga	gcagggggtt	109800
gggggtaagg	ttatagatta	acagcatccc	aaggcagaag	aatttttctt	agtacagaac	109860
aaaatggagt	ctcccattgc	tacttctttc	tacacagaca	cagtaacaat	ctgatctctc	109920
tttcttttcc	ccacatttcc	cccttttcta	ttcgacaaaa	ctgccatcgt	catcatggcc	109980
cgttctcaat	gagctgttgg	gtacacctcc	cagacggggt	ggcagctggg	cagaggggct	110040
cctcacttcc	cagatggggg	agccggggcag	aggcgccccc	cacctcccg	acggggcag	110100
ggccggggcg	aggcgccccc	cacctccctc	ccggtggggg	cggctggccg	ggcgggggct	110160
gaccccccac	ctccctcccg	gacggggcg	ctggccgggc	gggggctgac	ccccacctc	110220
cctcccagat	ggggcggtcg	gcccggggcg	ggctgcccc	cacctccctc	cgggacgggg	110280

47/122

cggtcgccgg	gctgaggggc	tcctcacttc	gcagaccggg	cggtcgccgg	gcggaggggc	110340
tcctcacttc	tcagacgggg	cgcccgggca	gagacgctcc	tcacctccca	gatgggggtg	110400
cggtcgggca	gagacactcc	tcagttccca	gacgggggtcg	cgcccgggca	gaggcgctcc	110460
tcctatccca	gacggggcg	cgggcgagag	gtgggtcccca	catctcagac	gatgggctgc	110520
cgggcgagaga	cactcctcac	ttcctagacg	ggatggcagc	cggggaagagg	tgctcctcac	110580
ttcccgagacg	gggcgggccg	tcagaggggc	tcctcacatc	ccagacgatg	ggcggttagg	110640
cagagacgct	cctcacttcc	cggacggggg	ggcgccggg	cagaggctgc	aatctcggca	110700
ctttgggagg	ccaaggcagg	cggtcgga	gtggagggtg	tagggagctg	agatcacgcc	110760
actgcactcc	agcctgggca	acattgagca	ttgagtggagc	gagactccgt	ctgcaatcct	110820
ggcacctcat	gaggccgagg	caggcagatc	actcgcggtc	aggagctgga	gaccagcccg	110880
gccaacacag	cgaaaccccg	tctccacca	aaaatgcaaa	aaccagtcag	gtgtggcggc	110940
gtgcgcctgc	aatcccaggc	actctgcagg	ctgaggcagg	agaatcaggc	agggaggttg	111000
cagtggcg	agatggcg	agtacagtc	agctcggtc	ttcacaaact	tggtggcatc	111060
agaggagagac	cggggagagg	gagagggaga	cgaggagag	cccccttttt	gctttctttt	111120
ggattatttg	aatttttcct	taaattttatt	tatcttactt	atttatttat	ttttttgagt	111180
gattctcctg	ccacagctcc	caagtgcag	ggactgcagg	catgtgccac	tacaccagc	111240
taattttttt	gtatttttag	tagagacagg	gtttcaccat	attggccagg	ctggtcttga	111300
actcttgacc	tcaagtgate	cacctgcctc	ggcctcccaa	agtgtggga	ttacaggcgt	111360
gagccaccat	gcccgcctt	ttcttagaat	ttatatattg	agttcttgat	tgatctttt	111420
tatgtaggct	ttttagtggc	ttcttagga	attacaatat	acatactttt	cacagtgtac	111480
tcacatttaa	tattttgttaa	cttcaagtgg	aatgtagaaa	acttaaccac	cataaaaaata	111540
gaactagggg	tgaggttaaa	aaagagagag	aaaagaaatg	taataaagat	ttaataaac	111600
cgtttttttt	ttttttctc	ttttttttt	gagacagagt	ctctctttct	gttaccagge	111660
tggagtgcag	tggcggtgat	ttggctcact	gcaacctccg	cctcctgggt	tcaagtgttt	111720
ctcctgcctc	agcctactga	gtagctggga	ttacagggtc	gcgccaccat	gccagctaa	111780
tttttgtatt	tttagtagag	acggtttcac	tgtgttgcc	aggatggtct	cgatttcttg	111840
acctttgtat	tcgctctcct	cagcctccca	aagtgtggg	attacaggcg	tgagccaccg	111900
cgcccgcta	agcttttaaa	tattttttt	acattgcact	ttttctcttt	tccttctagg	111960
attttagtaa	cccaaatgtt	agttttgtta	ttgtttggca	ggttcctgag	gctttcctta	112020
cttctttaa	ttttttttt	ctgtttgtca	gcttcgaaaa	tttctattca	tctgtcttca	112080
aattcactgg	ttcttcccg	ttatttccat	tctgttattg	agtctttgta	gtgaatttta	112140
aattttgttt	attatgtttt	ttagtcttaa	aattttcttt	ttttgtgtat	gtcttatact	112200
ttgtctctga	aactcttatt	tgtttcagga	gtgatcttat	ttcttagagc	atggttttag	112260
tagctactta	aaatttggtt	tatcatccca	gcatagtgt	cctcttgatt	gtcttttctc	112320
ttgtgagata	atgggatttt	ctggttcttt	atatgacaat	taattttgga	ttgtatcttg	112380
gacagtttga	cttacgttac	atgattctga	atcttgttta	aatcctgtgg	aaaatattga	112440
agtttttgct	ttacaagca	gttgacatag	ttaggttcag	tcacacaaat	ctaagcagca	112500
ttctgtcggc	tctggttcca	tcatcagttc	agttttgtat	cttatctgct	tatgtgcott	112560
tctgtgtcca	gtctgggacc	tggccaatgg	tcaggtccca	aagcctttgt	acacttttag	112620
aagcaggggc	atgcacaccc	agctcacgag	tggccccggg	agtgcacata	caactcgacg	112680
ttttcatggg	ctccttcttt	tctgtgatgt	cctgcacag	ttctgccttc	taagaacctc	112740
cctttatccc	tttctgtttg	tctggctaga	aagtcagggc	tttagattcc	ctatacttca	112800
gcacacttcc	tgtagctatg	tcaacctctg	tggccacgac	ttcttcttct	tgggactgca	112860
gtttctcttg	tcagaaagta	ggattcttgg	agctgctgtc	attgctgctg	tggctgctct	112920
gatgctgcct	gggagtcgaa	ggagagaaa	gaacaaaaca	aaacaaccca	ggggatttcc	112980
tccactctct	ttgatccgtg	agagccccct	ttcctgttcc	tcagaccaga	aatagagggc	113040
ctgtcttggg	acttcttctt	tgtgcactct	gtgtgcagtt	tcagcttttg	agtccaggcc	113100
aggaggtgct	ggacaaactt	gtcaggagta	cggaggtaact	gcaagttctg	attacttttc	113160
tcagtccacc	tgcttccaag	tccttggatg	catttgtcca	ttgttttgag	ttgcattcca	113220
tgggagagac	agaagagtgt	gcttatttca	tcttgacata	cttattagga	tttcatatca	113280
aatcaacgga	tgatattctc	tatattaatt	tgctgttttc	cctttagcaa	gcacattagg	113340
aaaataaacac	tttaaacacc	gcctttgggtg	gtttctgtca	taattattaa	tacttgactt	113400
tttttttttt	tttgagacgg	agtctcactc	tgctctttga	ggcattgtcc	ccataaactt	113460
ttggtaaagg	atcaataaatt	ttatctttca	tccacacaag	cttcaccata	aatttgatgt	113520
ttattcttcc	attttagcag	aattcagttt	ggtccaatag	gggctgtctt	caaactgatg	113580
ttttctcctt	cttagtgcct	cagagtagat	cctgttcaga	tacgttataa	cagggttaata	113640
tgagtttatt	ttgggtgtaa	agtactttga	aattcatgca	tagttttttc	atcatatgca	113700
ttttccatag	ctttgaacac	ccccatgtaa	ctctcctctt	ccacaaaaca	aacaatgaaa	113760
aagcaccttt	gtgatggaag	tttattttgc	aataggaact	cacagtgate	taagccctgc	113820
tattcatgaa	tataattcat	tactggagtc	caagttgctt	tttggttttt	gaagttctct	113880

48/122

tcttcccttg	caggtataga	acaagatgca	gtgaatactt	ttaccaaata	tatatctcca	113940
gatgctgcta	aaccaatacc	aattacagaa	gcaatgagaa	atgacatcat	aggtaagcag	114000
tgcttgaaac	tatggcaaaa	aaaaaatgac	aaaaaatgca	cagaactgac	aattttcggt	114060
attgactaag	ataatTTTTT	cttaacatgg	aattttagcag	ttcccttcct	aatttgtttt	114120
ctgagtattt	tttatatcgg	attatagctc	actttaaaag	tttctcggct	gcattcgggtg	114180
cgagggctct	tgccctgggccc	agatgggctg	cagtgtagcg	gggtgctcagg	cctgcccgtc	114240
gctgagcagc	cgggccggcg	ggcggtctacg	ctaaccggca	cagaccaccg	gatggactgg	114300
ccggpcagccc	cgcaccagtg	cacgaagtgg	gcgggacaga	aacttctggg	gttgggaagtc	114360
cagtggagct	aaaagccgggt	accaaagtct	ctaggcatca	gggctgcagc	ccaagagtct	114420
cacgaccagt	gggcaactgg	atggccagac	agggtgtctca	gtgggtggcct	ctccgtctca	114480
gggcttcatc	ccacttctca	gtgggcctga	cgctccctggg	caccctggat	gtctacctgc	114540
attagccaga	gccatcacat	ggcctgtgac	ttgccttttt	ttgccagtgtg	atttgtccac	114600
acacagtgtc	atctctgtgt	catttggcac	agctggagggt	gcaaggagga	gggcagcctc	114660
atgtccagtc	ccagtttccac	gtaactttat	tcttctgaat	aaagacaatt	tgctaacctt	114720
aaaaaaaaaa	aaaaaaaaaa	agtttttctt	atatgtttgga	cccaaattct	taggctttaa	114780
cctgaataac	aatgcagca	agatcaataa	atagtacaca	tttattaaac	actcactgtg	114840
tcccagacaa	tattccaagc	actttttatg	gatagactca	ttttaacttc	taaagaactt	114900
tgtgggataa	atacagttat	tttatagatg	aagaaactga	agcacagaga	agttaagtgc	114960
ttgtccagg	gtaacagctc	agatatggca	gcagtggat	ttgaaactag	accctcacat	115020
accttaactg	ctgtgctgtg	gcagtgtttt	tcatactgta	ggttgggacc	agccttctct	115080
tatgccctca	ccccctgccca	aaaaaaaaaa	aaaaaaaaaa	aaatatatat	atatatatat	115140
atataatata	atataatata	atatataaat	atatataaat	atatataat	ataaaatata	115200
tgtattagta	tatatgcata	tatagtatat	attatatatt	agtatatata	ctaatatata	115260
atatacatat	tagtgtgtgt	atatatatat	atactagaat	aaaaaaaaat	aagtatctca	115320
gagtagtaag	gacaaacatt	tcagaaaaat	gttttcatta	tatatacatg	tatgtatgtg	115380
tatgctgatt	caacaaatat	atcttctata	ggttatagca	aaatagtgtg	aaagctttta	115440
ctgtgtttta	tcaggaagac	cttaggtgaa	cgtatatcca	cagataaaag	agggtatttta	115500
ttcattcaat	aaatattaca	ttctcataag	tcctaataat	atgtattttt	attcttcaaa	115560
aaagttagta	tttgtgattt	atgaaataag	acatgttctt	gcacttttag	cagatctgtc	115620
ccgatgttgg	gcttctttta	tccttagtgt	gggtgctttg	cactcactca	ctgctgggga	115680
cagcaagacc	cctgttagtc	tcagctgtgt	ttcttaaat	ggccactgt	accttccagt	115740
tagctattct	ggggctccatg	tcagtgtggc	tccattttcc	ttttctttct	cccacacaga	115800
tacctataac	ggctataaca	taggcctggg	ggctgttggg	ggcttatccc	tatctgcttg	115860
tatttaagg	gtactgtttc	actagatttt	gctgacagat	gttgtcatga	gatttgagggt	115920
ttctgtgtgt	gttgtctctat	ttttatgtgg	gaatttgcta	ctatcatcat	ccctagacca	115980
gcttttctta	gtaatacaac	agggatgttc	tgactgatta	gagtttgcc	gtttgaagaa	116040
ttgtgtggct	agtgtttttt	ttttgagggg	agctgttacc	agttaatagc	ctgactggcg	116100
tgtggataaa	aaggaagcag	tttcaagtca	aataaaacac	ttaaaatgaa	accacactgc	116160
aactctcttt	cttttactta	agcttaatca	aattaatgat	gatgtaatcc	catgaaggaa	116220
aagtcttctg	aaggatcaag	ttgataacat	tttgtgatca	aagaatttga	gaaaacctct	116280
atcccagtg	ctatcattat	atattttagg	atgttaatta	cctgtgtggc	tttaggcaag	116340
tcatttttcc	tccttgagcc	ccattcttaa	tcctgtccaa	attatttgtc	tcctcttgca	116400
gttggaactat	tttaatatag	ctgtccttca	agtgagtgtt	gttcaaagga	gccttcactt	116460
tagctcttac	tgtgtaccca	ctttgcatag	tcttgtttta	aatgtaatcc	ttggattttt	116520
ggtgttgcta	actaattact	gtttttatgt	gaggatttag	agtgatccag	aatctatact	116580
tgactacact	ccttcatctt	ccacaaatgt	ttgaagtggt	agaattttta	aaaactttga	116640
aggtacagct	gacagaattt	gctgatgggt	tgggaagtgg	tggtatgaga	gggaaaaaaa	116700
ggaataaagc	atgactgcat	ttttgttttg	tttgtttgtt	tgtttttgag	acggagcttc	116760
actctcgcca	ggctggagtg	cagtggcggtg	atcttggctc	acggcaacct	ccgcctcctg	116820
ggttcaagcg	attcccctgc	ctcagcctcc	caagtagctg	ggactacagg	cgctcgccac	116880
cacgcctggc	taattttttt	ttttgtattt	tagtagaaac	gggggtttcac	cgtgttgccc	116940
aggatgggtc	ccatctcctg	acctcatgat	ctctcacct	tggcctccca	aagtgtgag	117000
gttacaggca	tatatataag	catataaagt	gtgttatagc	atacaaacag	gtatatatat	117060
aaacatgcag	tcacacacagc	tgataggaat	gaggcagtag	tgaaggagaa	gttgatgtag	117120
gagaggggac	agttgttaca	ggaaaagaag	ctggaggcag	aagggatgaa	ttccagtgtc	117180
cacatagaag	attgcttaga	tgggagcaag	gacaatttat	ctagagtcac	aggaaaagaat	117240
gcagtacacg	ggtagagatg	caggtgagtt	gaaagatgtg	agagatgatg	gaaataattt	117300
tctgattgct	tctatatctt	caagggaagc	ggaagcaaa	tcctcagcaa	agagaataga	117360
agaggtgtta	aatatttgag	aaaggagatg	tactgtagaa	aaaaaaaaaa	ctcagtttct	117420
ccttctgaac	tctcacaaaa	cagaaccctt	ccatgactct	agttgtgtgg	ggttttttcc	117480

49/122

ctgtcagcta	ccaattctgc	agatgattgt	tcaagtgaaca	ccaactgggt	gtcctctaag	117540
tcagttcagt	tctcacactg	tttacctgga	gatagcatca	gatcccacag	attgaggact	117600
ctgtcccaca	agactgcctc	cacttcagat	gccagttctca	agtacaagtt	gtggcctgtg	117660
cttctgactg	accttctata	aattggagtt	cccacagtc	cctccttggg	ttcaataaat	117720
ttgctagagc	agctctcaga	actcagggaa	atgctttaca	tatattttacc	cattttattat	117780
aaaggatatt	acaaaggata	cagattgaac	aggcagatgg	aagagatgca	tgggcaaggt	117840
atgggagagg	ggcacagagc	ttccatgcac	tctccaggtc	atgccaccct	ccaagaacct	117900
ctacagattt	agctattcag	aagccccct	ccccattctg	tccttttggg	ttttttgtgg	117960
agacttcatt	atataggcat	gattgatcat	tggctatttg	tgatcagctc	aaccttcagc	118020
cccctcatcc	cgggaggttg	gtgggtaggg	ctgaaagtcc	caaacgtgta	attctgcctt	118080
ggctcttctg	gtgattagcc	ctcatcctaa	agctcttttag	aggccacagc	cacaagtcat	118140
ctcatttagc	ttcaaaagaa	tccagagatt	ccatgaattt	taggcgctgt	atgctaagaa	118200
actggctaaa	ggccagttgc	aatgtctcag	gctgtaatc	ccagcacttt	gggaggtcga	118260
ggcaggagga	tcgtttcagg	ccatgagatc	aaaaccagcc	tggccaacat	agtgaagacc	118320
ccttacaaaa	aatttaaaaa	ttggccaggc	gtaatatgctc	ttgtctgtag	tctcagctac	118380
tcagaaggct	gagcatcact	gagccctgga	gttgaaggca	gcagtgagcc	atgatcgtgc	118440
cactgactcc	ggcttgggtg	acaaagtgag	accttgtctc	agaagaaaaa	ggaaaaaaa	118500
aaaactgggc	aaagactaaa	taacatattt	cacagtatca	cagatttgta	ttgtctagga	118560
aagtgaatgt	aaacagacca	ggacactagt	atgatccctt	ggtttcatga	aggtcccact	118620
aaagtcatga	acacaaagtg	agactaggca	tcattgttata	tggtttttcc	agccatgttt	118680
aacagctagc	taaatagcta	attgtttcgc	tgcagtttat	tttagcagtt	ccttatttta	118740
gcacatttca	tgttttaaaa	tttctaccaa	taacatttta	ataaaacttt	ttacagataa	118800
cttcacaaat	ccataatttt	ttaagttaca	atcccagaaa	tagaattgct	cattgaaagg	118860
gtatgttcat	ttttaaagtt	atgctagaaa	ctgccaaatt	gccttcagaa	aaaggtgttt	118920
gtatccccac	taacactagt	gttagttttc	tttgcccctt	gctcaagtat	acatatattt	118980
aaaaacaatg	ttgggccagt	ttactagata	aaaggtgtag	tgccctcctta	ttctaattcta	119040
tttgattact	agtgagtatg	tatgtctttt	cacgttggtc	attttatgtt	tggtcctttg	119100
tggattgtca	tgctcctttg	tcatttttct	tttggaaacat	ttcttagtag	tttataaag	119160
ctcttggtat	tttaatgata	gtaacctttt	aactgtcatg	catgctgcaa	atcttttttc	119220
tgtttggttg	cctttgtatt	ttgtttttgg	agggtttcta	tgtataggaa	ttaaatttta	119280
tgttgttaaa	tccttttgatt	tctgtttttg	tcctgttact	tcaaaagact	ttctatttta	119340
agatcaagtg	ttacctgtat	tttctttttg	ttctatttta	aacctcttaa	tttatatgcc	119400
tggtgtgtta	actcccaagt	tgattcacaa	gtgtgtatcac	atagtttgaa	tttagtggca	119460
ttctgaaata	ttacaacttc	ttttgcagca	aggattttgtg	gagaagatgg	acaggtggat	119520
cccaactgtt	tcgttttggc	acagtcacata	gtcttttagtg	caatggagca	agagtaagtt	119580
agttcatatt	ttcacattgt	gcacccctagg	gaatttgggt	tcattgttag	gaatgggctt	119640
cactcagcta	aaaacaaagt	atttttgaga	atttaaatat	tttggatatt	tacaagatca	119700
tataaagcat	actctatctt	ggttaacagt	ttctttttaa	tataaattat	gtgaactctt	119760
aaaattttca	ttttcatttt	caatgttaat	atttccctaag	ttaaaataat	ttgttttttag	119820
ttctgaaata	atttggggag	tgattgagtc	tgtagtgatt	atgactatta	gaattgggtt	119880
atatttttaa	ataatgcattg	tcttcagatg	gctctcctaa	tttgtagtt	aggctttaag	119940
ctaaatggat	gctatataac	taaateccaca	tagatttgtt	gaaatggctc	cagaggtttt	120000
ttagatttat	tactgctatg	tgccctttaa	aaaaatctat	tcattctttc	acttaacatt	120060
tatcagaaga	gtgctctgtg	taagacgtgg	ttaggcatag	tgccagtcct	gaaggaagtt	120120
acagcctaatt	aaaagacata	gggcatgttg	tttggttact	gtaatatgaa	gtggcatgtg	120180
ttaaatgtca	ggggagaact	acaaagtcat	aaaaaggtgg	gagagattac	atacaggtaa	120240
aggaatcagg	aatgacacca	tggggagtaa	ggtagtgttg	acctaggcct	ttaagatata	120300
atagggacag	tatggaaaaga	gtatattttt	cccacttaaa	ctctttcctt	ggtcggtccc	120360
tcaaattttc	ccttttgtcc	atgtgcaggc	acttttagtga	gtttctgcga	agtcaccatt	120420
tctgtaaaata	ccagattgaa	gtgctgacca	gtggaactgt	ttacctggct	gacattctct	120480
tctgtgagtc	agccctcttt	tatttctctg	aggtaaaagtc	tgcatttctt	ttcacactct	120540
attcgagctc	tccagcctct	aactatcaat	gctggggccc	tgtctatagg	aaataacaca	120600
gaagagccaa	gtcattttcca	aaaagatgta	tattgttttc	aagttgtttc	tgatggcaag	120660
agtaatttaa	taatatatta	gagagaacat	gaaaattcaa	tgtattaaat	aactctaatt	120720
ttgagaaac	taatttaact	actgcatgta	agagagtgca	tgtttttaat	tatttggagc	120780
tattttaaaa	ccacagaatt	tgaacttgc	ttccagtgca	taaattgcag	accagacttc	120840
agaagagaaa	aaaagtagta	aattttttct	tatgctcatc	atttttactt	tagtcacttg	120900
ataggattgc	ccagtgaaga	agcatttgca	acagacaaatg	agtatattaa	tcctttttgag	120960
gcatacagtg	tagtataatg	ctctttgtta	ggcttcaaca	agtgaattaa	ttttgttgga	121020
aagcaaatga	ctattaagta	gaaagaggat	tcccagtcctc	acaaagcagt	aatttagaca	121080

50/122

ctcgattctg	cctctttaca	agaatacagg	tactcagttg	atttgttttc	tcactccctt	121140
tctttgctat	aagttttaa	caacaatttg	tttaggttaa	tatgtcctca	tggaaatggtg	121200
gaaatgatca	gatataaaat	atttggtttg	gttaggttac	tctttatatg	tttgctggca	121260
aggaaccaca	aatccagttt	agtataat	ttactctagt	tcactaaaag	tttgcatacca	121320
gctgtgtagg	tagtgtttgt	ttcttggtta	cttttttttc	gtctaaaaga	atactttaaa	121380
acttttcaat	ctcaaatgac	tgtaaacttg	tgacaggtgt	taacagaaga	agtagatcctt	121440
tttgtttttt	gcttatgacc	tgtattttta	tatttgagct	tatagattag	agattgtgag	121500
agaaatctgt	ttatagtctt	attttccctt	gtgtattttt	tcttcctagt	acatggaaaa	121560
agaggatgca	gtgaatatct	tacaattctg	gttggcagca	gataacttcc	agtctcagct	121620
tgctgccaaa	aagggccaat	atgatggaca	ggaggcacag	aatgatgcca	tgattttata	121680
tgacaagtga	gttatattga	tagatggatt	cagcagatac	ttattgaaca	tttgatatgt	121740
tttggtgaaa	taaagatgaa	taaactcagt	ctctgttgtc	aaggagctca	caggaggcag	121800
cataaaagct	gcttttatat	ggtgtttgta	aaagctttgg	ggttcttaga	acaaaagt	121860
ctgctgggaa	aggggaggtg	tatgtggggt	aaacaggatg	gcaatggtgg	tgttcaaggga	121920
gtgtttccca	gaagagagat	tttgtttggg	tcccaaagaa	agaagggaat	tttgctaccc	121980
agagaaggca	gaaacaacaa	ttctaggcaa	aggcattggc	ccagaagcca	tggaaacgta	122040
ggggaaagtg	gcactttcaa	gaaacttgag	tttagataat	caaaggagtg	gggaataaat	122100
atgaggatgc	tggtactaat	tggaaatagat	tgtaaaggac	cttgaatgcc	tatttatggg	122160
tcttactctg	taaaaaaagt	aatctgctca	ggcacgttgt	taattagttt	tttattagtt	122220
ttcactgaaa	atgagaggat	ggaacatca	tacagtaaac	aaaattgaaa	atatctggtc	122280
aggcagatga	tgagcttgtg	gccagctctg	taacgtatgg	tattcttttc	atttaacttt	122340
cgccgttgtg	cttagctact	taggggctct	cgggcacggt	ggctcactcc	tgtaatcaca	122400
acactttgag	aggcagaggc	aggtgaatcg	cttgagccca	ggaatttgag	accagcctgg	122460
gcaacatggc	aaaacccgcc	tttactaaaa	atacaaaaat	tagctgagcg	tgatggcgtg	122520
cgccgttgtg	cctagctact	taggggctct	aggcagaagg	atcacctgag	ccttgggagg	122580
tcgaggctgc	agtgaagctg	gatccactgt	actccaccct	gggcagggca	gtagagttag	122640
acccgtgtct	caaaaaaaaa	aaaaacaaca	aaggtaattt	ggtatttgta	tccttaagca	122700
aatgctaaag	gggttaactt	gggatagaga	aaagtcacac	gatgttaggg	tttgaagaca	122760
ctaatagtat	ctaggccagt	ggttcctgaa	cattagctct	tgggctcttg	ctgggctgtc	122820
tgcataggaa	tcacctgaga	gcttattaaa	aataggtttt	caggctgggt	gcggtggctc	122880
acgctctata	tccagcact	ttgggaggct	gaggcagcgt	gattacttga	ggtcaggcgt	122940
tcaagaccag	cctggccaac	atggtaaaa	cccgtctcta	ctaaaaatac	aagaattagc	123000
caggcatgat	ggcacacacc	tgtaatccca	gctactcagg	aggctgagga	aggagaattg	123060
ctcgagcccg	ggaggtggag	gttgcagtga	gcccagatca	tgccactgca	ctccaggctg	123120
gctgacagag	ggagactctg	tctcagaaaa	aaaaaaaaaa	ataggttttc	agtctgggta	123180
ccggtggctc	acacctgtaa	tcccagcact	ttgggaggcc	aaggcaggca	gatcacttga	123240
ggtcaggagt	ttgagaactg	cctggccaac	atagtgaac	cttgtctcta	ctagaaacta	123300
caaaaaatta	actgggcatt	ttgacgggtg	cctataatcc	cagctactag	ggaggctgag	123360
gcaggagaat	tgcttgaacc	cgggaggcag	aggactgcat	ctcaaaaaaa	aaaaaaaaaa	123420
aaagggtttc	agtccectct	tctcagaaat	tctgattctg	caggtttgag	gtgtgaccag	123480
gaatctttat	ttttagaaga	cataccagat	aattctgata	aatagccagt	ttagggtatg	123540
agtctaattt	tctatttttg	caagtaagga	aaataaggcc	cagagaggta	atgattttct	123600
caaagtccaca	gaacaagtta	gtggcagaat	ttggactgga	atgcagtctt	taatgttctg	123660
tccagtgttt	attctggtac	agtatgtttg	tagaaggtat	tacgtaagaa	acattgttat	123720
atagatgttg	agataggaag	agtttacatt	tgaaaatttg	gtctaaaatg	cctgaacatt	123780
caagtctgtg	aggagatttg	accaacttac	tcaatacaac	ataggagatt	cacattttgt	123840
tacaaaaatg	ctgattttaa	aggagagttt	tctttttttt	cttctttttt	attttttgag	123900
atggagtctt	gctctgtcac	ccaggctaga	gtgcagtgc	acgatctcag	ctcactgcaa	123960
cctccacctc	ctgggttcaa	gcggttctcc	tgccctcagc	tcctgagtag	ctgggattac	124020
aggtgggggc	caccacgccc	agctaatttt	tgtattttta	gtagagacag	ggtttcacca	124080
tggtggccag	gcgggtcttg	aactcctgac	ctcaagtgat	ccaccacca	ctgcctccca	124140
aagtgtctgg	attataggcg	tgagccactg	tgcccagcct	gcttgttttt	gtatcatata	124200
tatgcatcat	cataatcatg	cattatcaac	ctttgtattt	ctgtcaggac	atagaaacca	124260
ttagagtgtc	tggagagag	cctttttttt	ttctcgcgat	ttaatgcttt	ttttggtatt	124320
catttcataa	tcagcttacc	aaaacattac	ctgcattata	ccccatcaag	gtagaatctt	124380
ttgtgttatc	aatattgggt	actccctttc	cacaccgagt	catcagtaag	tcctgttcta	124440
tccaaatagg	tcatatgcat	ctagctcacc	cctcagtgct	gttttgtttt	gaatttgtac	124500
atgtttactc	gtagtgctt	gtagtgctt	ttattttatt	ttattttatt	ctgtgcatac	124560
aagttctcag	ctcgcttttt	agggaaaatg	accatgtctt	cctttcctat	aaattccttt	124620
ctatctatca	agtcctcaac	agagaatagg	taccataaaa	tatgtgattg	ttagtttctt	124680

51/122

tgccctcagtt	gtagtctgat	ccttacagct	tttaaacac	agtagagttc	accgtcaaga	124740
actaaggatg	gttggcaggc	agatagaaag	gtagcaagtt	gacccaacta	tctctgggga	124800
agtgggaaca	aagaaagggt	acatcagcac	tgtcatcaca	tagctctata	gttctaggcc	124860
tgagggtca	atcaagtagc	cctgtataag	attctctgga	ggagggtgctg	aaagttgctt	124920
atacttgcta	tggaatttga	ttttacttcg	gatatctttt	taccataggt	acttctccct	124980
ccaagccaca	catcctcttg	gattttgatga	tgttgtacga	ttagaaattg	aatccaatat	125040
ctgcaggga	ggtgggccac	tccccaactg	tttcacaact	ccattacgtc	aggcctggac	125100
aaccatggag	aaggtaaccc	agaacttcaa	acgtatcaaa	ctacaagaag	ttttattggt	125160
agaactcata	aaatataagg	tgggaaaacc	aagcagaata	gcacagtgga	aattgaagca	125220
gtccagcaaa	gtgattaaga	gcagaggcct	tgagtctggc	ctggtagta	cagtcacgtg	125280
ccacataaca	ttttagtcaa	cagtggactg	cgtgtacgat	ggtcctgtac	gattataatg	125340
gatcaaaagt	ggtagtgcga	taataacaaa	agtttagaaaa	aataaatttt	aataagtaaa	125400
aaagaaaaaa	gaaaaactaa	aaagataaaa	gaataaccaa	gaacaaaaaca	aaaaaaatta	125460
taatggagct	gaaaaatctc	tgttgccctca	tatttactgt	actatacttt	taatcattat	125520
tttagagtgc	tccttctact	tactaagaaa	acagtttaact	gtaaaacagc	ttcagacagg	125580
tccttcaggaa	ggtttccaga	aggaggcatt	gtttcaaaag	gagatgacgg	ctccatgcgt	125640
gttactgccc	ctgaagacct	tccagtgagg	caagatgtgg	aggtgaaaga	aagtgttatt	125700
gatgatcctg	accctgtgta	ggcttaggct	aatgtgggtg	tttgtcttag	tttttaacaa	125760
acaaatttaa	aaagaaaaaa	aaaattaaaa	atagaaaaaa	gcttataaaa	taaggatata	125820
atgaaaatat	ttttgtacag	ctgtatatgt	ttgtgtttta	agctgttatg	acaacagagt	125880
caaaaagcta	aaaaagtaaa	aacagttaaa	aagttacagt	aagctaattt	attatttaag	125940
aaaaaatttt	taaatataatt	tagtgtagcc	taagtgtaca	gtgtaagtct	acagtgtgt	126000
acaataatgt	gctaggccct	cacattcact	taccactcac	tcgctgactc	acccagagca	126060
acttccagtc	ttgcaagctc	cattcatggg	aagtgcccta	tacagatgta	ccatttttta	126120
tcctttatag	tgtattttta	ctgtgccttt	tcgttatatt	tgtttaataa	cacaaattct	126180
taccatttga	atagtggcct	acgatattca	ttatagtaac	atgtgatata	ggtttgttagc	126240
ccaaaaagcaa	taggttgttac	catatagcca	aggggtgtag	tagggccatac	catctagggt	126300
tgtataagta	cactctgtga	tgttagcaca	atggcaagca	gcctaaccgga	aattctgttt	126360
attgattgat	tgattgattg	attgattgag	acagagtttc	actccattgt	ccaggctgga	126420
gtgcagttgc	acagttcttg	cacactgcaa	cttctgcctc	ccagggtcaa	ccaattatcc	126480
tgccctcatcc	tcccaagtag	ctgggattac	aggcaggcac	caccatacct	ggctaatttt	126540
tgtatttttag	tagagacagg	gtttcaccat	tttggccagg	ctgttctcga	actcctgacc	126600
ttaagtgtac	tgccgtgctt	ggcctccgaa	agtgctggga	ttacaggcat	gagctaccat	126660
gcctggcgag	taactgaaat	tctctaagtc	catgttccct	atctgtaaag	tgacgataat	126720
atgcacggtt	acctcaaagt	tactttgatg	attaaagtaa	ggtaatgtat	ataaaatata	126780
tattaaacata	gtacctgaca	catggtaagc	atcaaaaaat	gttaactact	tttattacta	126840
ttattattac	gtatttttaa	ataattagag	agcagtatca	aaaatttagct	ggcgctagtg	126900
gcatgcacct	atagttccag	ctactcagga	ggctgaagct	ggaggattgc	atgagcctgg	126960
gaattaaagg	ctgcagtgag	ccgtgttcat	gcccctgcac	tccagccttg	gtgacagagc	127020
aagaccctgt	cttgaacaat	taaagaaggc	attatgccgc	aacgttagct	tagaaatgat	127080
ccacatatat	caccagtaac	tgtcaacagg	attggaaccc	tagttttggg	tattatgatc	127140
acaagggtatt	attaatagct	tattaataat	aaagcgttgg	ctaggcacgg	cgactcacat	127200
ctgtaattccc	agcacttttg	gaggccgagg	tgggtggatc	acctgaggtc	aggagtttga	127260
gaccagcctg	accaacatgg	agaaacccca	tctctactaa	aaatacaaaa	ttagccgggc	127320
gtgggtgggtg	atgcctgtaa	tcccagctac	ttaggaggct	gaggcaggaa	aatctcttga	127380
acccgggagg	cagagggttg	agtgagctga	gatcgaccca	ttgcaactcca	gcctggggcaa	127440
caagagcaaaa	actccgtctc	aaaaatataa	ttataataaa	taaataaaaag	taaagtattg	127500
atgtttgtga	atgattttatt	cttctaataa	actagaggag	atttttccag	gaatttcaga	127560
gccagtgagg	ttatgttgct	tgtatgtgtc	atgtgtatcc	aggtgaaaaa	acttaattaa	127620
acgttattat	ataataccat	acataaaaaac	tgaatttttag	gaatactgaa	gaatgacata	127680
tagaagtcaa	atcatataat	agctagtagt	aaacagaata	gagtgctcagc	tgttacccaa	127740
tgatgataat	atttttcacga	ttaaaatttaa	accttttctg	attttaaaag	aaaagttcag	127800
atctgtatca	tataaagaat	gtaaattttc	agggtaataa	aattaaaaatg	cagagagaaa	127860
aatgcaaaaa	tagttctttac	tagatgtgtg	tatgtaagga	acttagacta	attttaagaa	127920
cactgtcaag	accctggtag	ttaggttaga	aaaaagacat	gaatgattca	ttcaacaaaa	127980
actttgagta	tttctgtgct	agatggtagt	gttacagtg	taaacaaaaat	aaatgtgttt	128040
ctgctatcct	ggagcttagt	ctacaaaaaa	ggtagacatt	ggccggggcac	ggtggctcac	128100
gcctgtaatc	tagcacttt	ggaagatcga	ggcgggtgga	tcacctgagg	tcaggagttc	128160
aagaccagct	tgggcaacat	ggcgaaaccc	cgtctctact	aaaaatacaa	aaattaaactg	128220
ggtgtggtgg	cggacacctg	taatccacgc	tactcgggag	gctgaggcag	gagaatcact	128280

52/122

tgaacctggg	agacagaggt	tccagtga	cgagatcatg	ccactgcatt	ccagcccggg	128340
ggacaaaagc	gaaaatacgt	ctcaaaaaa	caaaaacaaa	caacaaaggc	acgtattaaa	128400
tacgaacata	aataatttaca	aattatactg	aataagttct	catgtttatt	atttgcttgt	128460
ccagttacaa	acttttccct	cgtagaatta	gaaatataaa	taataaacat	gagaactcat	128520
tcagtataat	taataattat	taaatgtaaa	taaaaacatc	tatgtacaat	taggcattta	128580
tttaagaatt	atttgaaaaa	aaaacaatgt	ggaaacagat	attttgatat	attgctagt	128640
attgaaattg	ataatgttct	tttgaagagt	aaagtgaacca	tatatattaa	agttaaaaat	128700
taactcagca	atcacacgcc	tggtgaggtta	tcttaaggaa	atcagtttga	aagtaaaatc	128760
aatatatgca	caaagacttt	aacattttatc	ataaaccaga	aaaatcgagt	ttcaaatat	128820
atcctatgga	ctattttctg	ctaaaaagta	ttaatatcaa	ctttatgtaa	tactttcgtg	128880
acaaatattt	tgggggagaa	aaccacaaca	aattacatgc	attgtaattt	tttttttttt	128940
ttttttttta	gacagtcctg	ctccagcgctc	caggctggag	tgcagtgggtg	caatctcggc	129000
tcactgcaac	ctccatctcc	cagggttcaag	caattctcct	gcctcaggcc	tcccagtag	129060
ctgggattac	aggcgctcac	caccatgcct	agctaatttt	tatagttttt	agtagagatg	129120
gggtttcatc	atgttggcca	ggctgggtctt	gaactcctgg	tctcaagtga	tccgtctgcc	129180
tcggctcctc	agagtgtctga	gattacaggt	gtaagccact	gcaccagcc	ttatgcatta	129240
taattttaat	ttgtaaactg	tacaaaggga	taatacttgt	agtacaacaa	gaagtaaaaa	129300
catttgttat	aggtagttaa	catttgtaac	cagtagaatt	ataggtaaaa	tttattttatt	129360
taaaacagtt	ttagttggat	ttgatttcaa	ctttaaaaata	atgcttttca	tctctatcag	129420
gtctttttgc	ctggcttttt	gtccagcaat	ctttattata	aatatttgaa	tgatctcatc	129480
cattcggttc	gaggagatga	atttctgggc	gggaacgtgt	cgctgactgc	tcctggctct	129540
gttggtccctc	ctgatgagtc	tcacccaggg	agttctgaca	gctctgcgtc	tcaggtattg	129600
actgattgcg	tctgccatta	gggagaaaag	catacacatc	ctttccttca	catcccagta	129660
acagatccta	ttattttgtaa	atttttaagtt	gtggaaaaaa	aagataaaaag	ccaggcacag	129720
gaatcgcttg	ctgtaatccc	agcacttttg	gaggctgcgg	tgggaggatc	acacgaggtc	129780
aggaattcga	gaccagcctg	gccgacatgg	tgaacccca	tctctactaa	aaatacaaaa	129840
attagccggg	catgggtggca	ggcacctgta	atcctagcta	cttgggaggc	tgaggcagga	129900
gaatcgcttg	aacccaggag	gcagaggttg	caatgaacca	aaatcacgcc	actgcactcc	129960
agcctgggtg	acaaagtggg	actgtgtctc	aaaaaaaaaa	aaaaaagaga	gaaataaaat	130020
tagcctactt	actatcttct	aatcaaaagca	tttgtggtaa	cttaaaatat	actgtattgt	130080
aaagtatcat	gtgttttcat	ttaggccatt	attctatttg	aatctgtggc	tgtttctctt	130140
aataaatcaa	gtaatatgga	atatattcat	agcctctgaa	gagctcttta	tgtaagtatt	130200
tatttaggat	actttttgta	aaataagtga	atgaattctt	aggtctcctt	tttttttctt	130260
ttcttgagac	agggctcctc	cgctgcaacc	tggaaattct	gggctcaaat	aatccaccca	130320
ccacagcctc	ctgaatagct	gggactagag	gcatgcacca	ccacgcctgg	ctaatttgaa	130380
atthtttttt	ggccaggcat	gatgggtcac	gcctgtaatc	ccagcacttt	gggagaccga	130440
ggcaggcaga	tcacgaggtc	gggagatgga	gaccagcctg	gccaaactgg	tgaaaccccg	130500
tctctactaa	aaatacaaaa	attagctggg	tatgggtggc	catgcctgta	atcccagcta	130560
cttgggaggc	tgaggcagga	gaatggcttc	aaccagggag	tcggagggtg	cagtgaagccg	130620
agatcacgcc	actgcactcc	tgcatgggtga	cagagtga	ctccatctca	aaaaaaattt	130680
tttttttaaa	tgatggagtc	ttgctgtgtt	gctcaggctg	gtcttgaacc	cctgacctca	130740
aatgccgcct	gcttcagcct	aagtttcttt	tttttttgta	aagagacagg	gtcttgctat	130800
gttggccagg	gtagtctcaa	actcctggct	tcaagcagtc	ctcccacctt	ggcctctcaa	130860
agtgtgggga	ttacaggcgt	gaaccactac	ctataatgtt	gtgtttcact	caaggccttt	130920
tgatttctgt	ttgcattacc	gtgccacatt	gtgcatttcc	ttgacctttt	ttgggttttt	130980
tgagtgctt	tcatatggtta	aaccatacct	gattctcctc	aaaatcacac	aaagtagaat	131040
atcctaagac	aagaaatcta	aggaggcata	aagaagttaa	ctggttttat	taaaactcaca	131100
cagtaaatga	tagagccaga	aatattcccc	ttctagtgtt	cttcaccatc	agcttaattgt	131160
agcataataa	ttttcttaatt	actgttgaca	aataaataac	cctttgaatt	ttcaatactg	131220
ggccttggtg	aaattttcct	aatttgttaag	agagtattat	cgtattgcca	tttacaagac	131280
tctcctgagt	atctttttct	tctgttaagt	ttacctagga	gataaaactgc	tgagtatggg	131340
tgccattttg	gtttttttgat	ataggttaga	atgtcttggg	tttttttttt	tttttttttg	131400
gtttttgttg	ttgtcattgt	ttgagacagc	atcttgcctc	gtcggccagg	ctggagtga	131460
atggcacgat	cgtggctcac	tgcaacctcc	acctcccggg	ttcaagcaat	tctcctgcct	131520
cagcttctct	agtagctggg	attacaggca	tgtgcaacca	cacctggcta	attttttgtg	131580
tttttagtaga	gaaggggttt	caccatgttg	gtcaggctgg	tattgaactg	ctgacctcat	131640
gatccacctg	cctcgccctc	ccaaagtgtc	gggattgcag	gcatgagcca	ctgcacctgg	131700
ctgaatgtct	tgtttttgat	taggcactta	aggaaggcct	aggtactaac	cataaaatat	131760
atthtttatac	cttttgttga	tactatatat	atagaaaact	gcacttatca	taaccttaga	131820
caccttgaag	aatgttcaca	agcagaacta	acccatgtga	cccagcatcc	agatcaaaaa	131880

53/122

cagcattatc	agccccctcta	gaagccctct	tggggccctt	ccattcactg	tccttcttgt	131940
caccagggtg	gctactatcc	tgacttttga	tggcatagat	tagcattacc	tggtcttgtc	132000
attttataaa	taaaaccata	ctgtgtattc	ttttcttcta	cagctttatt	gtgctaattc	132060
acatttacat	catacaattc	agtgggtttt	atatggtcac	agagttaggt	aaccattacc	132120
acatcgattt	tagaacattt	ttttcactcc	agatagaaac	cccccttact	taaactccaa	132180
atccccact	ccaccagccc	taggcagcca	ctagtctact	ttttatctct	atagagacaa	132240
tagatttgct	tattctggac	atttcataaa	catggaaccg	tatattatgt	ggctctttgt	132300
tgccaactgt	ctttcactta	gcacatgtg	ttcaaaagag	catcatgtta	tccatgtttg	132360
gcatgtatca	gaattttatt	cctcattatg	gccaaatata	ccattgcaag	gatttatgac	132420
attttatttg	aattgtaccc	tcctttctgc	cattttatcaa	taatgctact	gtgaccattt	132480
gtgtacaagt	ttttgtgtgg	atacagggtt	tccttttctg	tttaaatttg	aggtggagtc	132540
ttgtctgtgc	gcccaggctg	gagtgcagtg	gcacaatctc	ggctcactgc	aacctctgtc	132600
tcctgggttc	aagcagttct	cctgcctcag	cctcccagag	atctgggact	ataggcacgc	132660
accaccacgc	ccagctaat	ttttagtaga	gatgggggtt	caccatgttg	gccagctctg	132720
tctcgaaact	ttgacctcaa	gtgatccacc	catctcggcc	tcccaaagtg	ctgggattac	132780
aggggtgagc	cactatgccc	ggctgtgggt	ctcattttct	ttgttgtata	tacataggag	132840
tagaattgct	gagtcaagag	gtaactctta	aaacttattga	aaaactgcc	gattgttttc	132900
cgaaaaggct	gcaccatttt	gcaatccac	cagcagtgta	tgagttttac	agcttctcca	132960
catttcattg	gaacttatata	ctctgttggc	tggtttttaa	aatgatagtc	attccaataa	133020
gttctacttc	agtgtgtgtt	ttgcacttct	ctgatgagta	atgatgttga	gcactctttc	133080
atttgcttat	tggcctttgt	tctagctttg	gaaaaatgtt	tattcaaata	ctttggccat	133140
ttttattttt	atttttattt	atttattttt	ttttgagacc	aagtctcact	ctgtcagcca	133200
ggctggagta	caatggtgtg	gtctcagctc	actgcaacct	ccgcctcctg	tgttcaagtg	133260
attctcctgc	ctcagcctcc	cgagtagctg	ggattacatt	tcaggcacct	gccagcatgc	133320
cggggtgatt	tttgtatttt	tactagtgtg	aggggtttcac	catgttagcc	aggctggtca	133380
caaactcctg	acctcaggtg	atctgcctgc	ctaggcttcc	caaagtgtct	ggattacagg	133440
cgtgagccat	tggggcccagc	ctagattttc	ttttttcttt	ttttttttga	gaaggagtct	133500
tgctcttgtt	gcccaggctg	gagtgtcaatg	gcacaatctt	ggctcactgc	aacctctgcc	133560
tcctgggttc	aagcgatttt	cctgcctcag	cctccccagt	agctgggatt	acaggtgcct	133620
accaccacac	ccagctaaact	tttgtatttt	tttttagagac	aggggtttcac	catgttggcc	133680
aggctgggtc	caactcctga	cctcaggtga	tcacacctgc	ttggcctccc	gaagtgtctg	133740
gattaccggc	atgagctacc	aggcccagcc	aattttctca	ttatattgcc	caggctgggtc	133800
tcaaactcct	gggttcaagt	gatcctcctg	ccttggcctc	ccaaagtgtg	gggagtacag	133860
cgtgtagcca	ccttgctcag	cccctttgcc	cattttttaa	ttagattgcc	tttttatatt	133920
gagtttcagg	agtcctttat	atattctaga	taaagtgtccc	ttatcaaatt	atattatttc	133980
caggattttt	cttcattctg	tgagttgtct	ttcctctacc	ttttaaaaaa	gggtgggtttt	134040
tgtttgtttg	tttgtttgtt	tttttaagat	aaggtctcat	tctgctgccc	aggctggagt	134100
gcagtggcac	aatcacagct	cactgccacc	tcaacttcct	gggcccgaagt	gatcctctta	134160
cttcagcctc	ctgaatagct	agggccatag	atacacacta	tcacaccag	cttttttttt	134220
ctgtttgtag	agacagatct	tactgtgttg	cccaagttgg	tctcaaaact	taggctcaaa	134280
gtgattctcc	cacctctgcc	tcccagagtg	ctgggattac	aggtgtgagc	cacacgcaac	134340
ctgtcttttc	actattaata	gtgtcttctc	gcttcagcct	cccagtagtc	tgggattaca	134400
ggcaccaccc	acctagcctg	gctaattttt	ttgcattttt	agtagagaca	gtgtttcacc	134460
atgttcaccc	ggctggtctt	gaactcctga	cctcaggtga	ttcacctgcc	atggcctccc	134520
aaagtgtctg	gattacaggc	gtgagccact	gcacccggcc	aaaatatgtc	cttcttaaca	134580
gtattgtctt	ctaattttgt	aacatggatg	tatcttcatg	tatttatgtg	ttcttctcatt	134640
tcagcagaat	tttgtagttt	tcagagtaga	agcctttcac	ctccttgggt	catttattcc	134700
tatgttttaa	gttcttttctg	attccattat	aaatagaatt	gttttcttaa	tttcattttc	134760
agattgtttg	atgagagagc	atagaaatac	aagtgtattt	tacatgttga	tcttgcaact	134820
tcaactttga	taaatctgat	tgttagctct	aatagttttc	ttgtggattc	tttaggattt	134880
tcaatatata	agatcatgtc	atttatggat	agagatagtt	tttttctctg	ctagaactta	134940
cagagcaatg	atgagtagaa	gtggcagaag	caaaaaatct	tgtcttgttt	cctatctgac	135000
agggaaagct	ttcagtttca	tcatttaata	tgatgttagg	tgtgggtttt	caataaatgc	135060
cttttttcag	attcaggaat	ttccctatca	ttcctgattt	tttaaggctt	tttttttttt	135120
ttaaatcatg	aaagggtgtt	gaatattgtc	atgttctttc	tgtatcagta	taaatgatcc	135180
tatggatttt	gggttttatt	ctgttgatgt	gaaatattaa	ttgattttca	gatgttaaac	135240
caaccttgca	tacttgagat	gaatctcact	tggtcatggt	gtataatctt	ttcaatatgc	135300
tgctggattc	cattttactg	tattttgttg	aagattttgt	atctgaacgc	ttaaagataac	135360
atttacactc	tatcagaaat	gaattgacca	taaagtgtgag	agtgtatttg	tgggttcttg	135420
attctcttcc	attccaaaaga	tagacataca	tccgtctgta	tgtctgtctt	tatgccagta	135480

54/122

ccatactctc	ttgattacta	ttgcttttga	ataagttttg	aaatcagaaa	gtataaaatga	135540
gatttttggt	tctgagtaac	agtcctcata	gaattagttg	ggaaatattc	cctcttttatt	135600
ctgggccctc	tttctttttt	gtttaactgt	gtatcttgga	gattgttcct	tctcaacaca	135660
tgagagccgc	tttccctacc	ctcccacccc	tgctatagag	aggctctataa	gtgtctgttc	135720
aattattttta	tttactttaac	ctattacttta	gtcggggaca	ttaagcttgt	ttatgtcttt	135780
tatttttaaac	aatgctgcag	tgaataatct	tgtatataag	tcatttttcca	tcaatataag	135840
tctctctgtga	actgaatttt	tagaagtggg	atttctaggt	caacctatgg	ctctgtattt	135900
cacaaaaata	ccaattctgg	tttttcttgt	ggaggtgggg	agtaggaggt	agaatgctgg	135960
aggagaactt	gctgtactca	gctggctagt	catttttagaa	aggtttccct	agcttctttt	136020
tgtcatatgg	cctcaccaag	aatcaaaaac	attcctattt	accctgtaaa	catggggctt	136080
tactacccaa	gatacatatt	tctggatgta	tgacagcttt	tcatattgaa	gaaataatgc	136140
tgtgagtaca	gcacatttgt	tggaacttag	gtcgttaaga	atgtcttata	aattcatata	136200
ttataacattt	tatttttttag	tatttttttag	tttttgatac	agagtcttcc	tctgtcgcct	136260
aggccagcgt	gcagtggtac	aatcttggct	cactgcgcacc	tccatctcct	gggctcaagt	136320
gattctcatg	tctcagcctc	cagagtagct	atggttacag	gcacgcacca	ccatgcccg	136380
ctaattttttt	tatttttttag	agaaactggg	tttccaccata	tgaccatgc	tgccctcgaa	136440
ctcttggcct	caagtgtatc	gcctgcctca	gcctcccaaa	gtgctgggat	ccttgtattg	136500
ggtaaaagat	gaatattgag	ggctgcatgg	tggtcatcac	ctgtaatccc	agcactttct	136560
gagactgagg	cgggaggagt	cctggagccc	aggaggggga	ggctgcagtg	agttgtgatc	136620
gcgcatttgc	acttcaacct	aggaattata	ggcttcagtc	actgtgccc	gcacgtacat	136680
tttaaatattg	tgcttttctc	ttttagctat	agtatgaggt	tacatttcag	agtcatttgt	136740
gttaacgcatc	ttaataagtga	tgaggttgag	tgaaagttac	ttctatttca	aacactgaag	136800
aaaattttgt	acaaatctgt	cacattccaa	gcccaggact	gattgtttca	tatacttcta	136860
atttttacaat	ttctattgta	gtccagtgtg	aaaaaagcca	gtattaaaaat	actgaaaaat	136920
tttgatgaag	cgataattgt	ggatgcggca	agtcctggatc	cagaatcttt	atatcaacgg	136980
acatatgccc	ggtaagctta	gctcatgcct	agaattttta	caagtgtaaa	taactttgca	137040
tcttttaaat	tttttaatta	aatttttacat	ttttttctaa	tctattatta	tatgcccgaa	137100
acttttcactt	agagtgtgca	gtataatgtg	gtgggttaagt	ataaaggctc	tggagtgaat	137160
tcttgggtttt	taatcttggc	tctgcatctt	attggcagcc	gctaacctct	tgggtatctca	137220
gtttcttcat	ctgtaaaaatg	agaataataa	agtgaataaga	tgccaacatc	atttactctg	137280
ggctgcataaa	ctgatacttg	gaaaaagtat	tctcttgagt	ttaagaatta	agttggttat	137340
tcatttttagc	ttgtaataaa	aagatagtga	ttcataggat	atgccactta	ctgaaattta	137400
ccacagatcc	aatcataaaa	tcactttctc	ttccctaaag	atagcttgat	taacatgtaa	137460
agggtgtgtaa	aggcttgatt	acactaccct	gatccgtacc	ccagttccca	gcagcaccat	137520
gaaaaaggga	tttcaacata	tttaattact	ttcagtagaa	agtaacagtg	gtaggccagg	137580
cgcagtggtt	cacacctgta	atcccagcac	tttgggaggc	cgaggtgggc	ggatcacgag	137640
gtcaggagat	tgagaccatc	ctggctaaca	cgatgaaacc	cgtctctac	taaaaataca	137700
aaaaattagc	cgggcattgt	ggcaggcacc	tgtagtccca	gctacttggg	aggctgagac	137760
aggagaatgg	cgtgagcccc	ggaggcggag	cttgagtgta	gcttagattg	tgccactgca	137820
ctccagcctg	cgcagtgagg	cgagactctt	gtctcaaaaa	aaaagaaagt	aacagtggta	137880
ttgggagact	gaggagccta	gaaagtactt	gaaggaaagta	aaaggtttgt	ttgaccacat	137940
tgtatttgga	aagccagctt	tttcagctgt	gtcagctttg	tgtagtgtat	tttagttctt	138000
cttttagaaa	ataacggaca	aggccgggca	cgggtggctca	cgctgtaat	cccaccactt	138060
tgaggaggcc	agacggggcg	attacctgat	ctcaggagtt	cgagaccagc	ctgggcaaca	138120
tggtgaaacc	ccgtctctac	taaaaataca	aaagttagcc	gggctgggtg	gcgtgtgcct	138180
gtagtcaccg	ctactccgga	ggctgaggca	ggagaattgc	ttgaaccggg	gaggcggagg	138240
ttgcagtgag	ccaagatcac	accattgcac	tgacgcctgc	gcgacagagt	aagactctgt	138300
ctcaaaaaat	aataataaaa	taaaaaagaa	tggacagtaa	acctaaatga	gttcattccc	138360
aaagatgatg	ttattcttaa	gggatgggtc	atttatttaa	gaccttatcat	aaagtctatc	138420
aattgcgtga	tttttcaact	ctgtaattgt	gtgtatgtat	aatgtaaata	tatatgtttt	138480
tgttttgggt	tggttttttg	agacggagtc	tgcgtctgtt	gctcaggctg	gaatgcagtg	138540
gtgcaatctc	agctctctgc	aaactctgtc	tcccagggtc	aagcgtttct	tctgcctcat	138600
cctcccaagt	agctgggact	acaggcacgt	gccaccacgc	cgggctaatt	ttttgtattt	138660
ttagtagaga	tggggtttca	ccgtgttagc	caggatggct	tcaatctcct	gacctcgtga	138720
tccacccgcg	ttggcttccc	aaagtgttgc	tattacaggc	atgagccacc	acaccagca	138780
tgtatttttt	aaatgtataa	aatgaagcag	aaaagagaaa	tgataatttt	tcttcatctt	138840
gaaagattat	cttcaccagg	cgcagtggtc	cacacttgta	atcccagcac	tttgggaggc	138900
ctcggcaggc	ggctcaactt	agtctgaaac	cagcctggcc	gacatgggtg	aactccgtct	138960
ctactaaaaa	taaataaata	aagatgggtt	taatatatgt	tttagtttta	tgatttttagc	139020
atcttttctga	aatttttctc	aaggcaagta	aatttgtatc	agttgtgata	ttggtaccca	139080

55/122

tctatgaaat	aacttattag	gaagatatct	ctaaaaataag	atcactttgc	ctaaaaataaa	139140
ctgatatatt	gatgttcaca	gaatttttct	tttaaccgac	ttgataaatg	cattatttctt	139200
gacgtcaagt	gatccacctt	cctcagcctc	ccaaagtgtc	gggattacac	acatgagcca	139260
ccgcacctgg	cattatttct	ataaaaaggt	aaattttctag	ttaagttaa	tgctctctt	139320
gttcatgtac	cattgtctat	tttcttcct	tcctactcac	agtaatcatt	cttatggtat	139380
gcacttttgt	ttgtctattt	ttatgtaatt	gatattacgc	tccattctgt	acgttggtact	139440
ttcattcaca	gtgagttttg	gacattccta	tgttcatcta	tacagactta	cttcatttta	139500
actacactgt	agtattccgt	atgtaatt	tactataact	catcactgta	gcagagcatc	139560
tcatagtgta	tgtattactg	ttttgccatt	ttggtatcaa	tgagtattta	agtcatttgc	139620
agtttttccc	tcttatacc	agtattacag	aggatctctt	tttatatgct	tctttgtacc	139680
aagaggcaga	ttaaaaaatt	tttttttgaa	aaaatttttg	aaaaaaaatg	aatgaagtc	139740
tcactatgtt	gcccaggctg	gtctcaaact	cctaggctca	agcaatcctt	ccatcttggc	139800
ctcccaag	gctggggtta	caggcatgag	ccaccatgcc	tgccctacat	tttaaat	139860
gatagctctt	acaatttact	ttgtaaagta	tctgcatcat	tttatgttct	caccagtctt	139920
taataagaat	acttcatact	tttggctgga	cacagtggtc	cacgcctgta	atcccagcac	139980
tttgggaggg	cgaggcgggc	agatcaagag	atcgagacca	ccctggccaa	tatggtgaaa	140040
ccctgtctct	actaaaaata	caaaaattag	ctgggcgtgg	tgccgcaccc	gtagtccag	140100
ctactcgaga	ggctgagaca	ggagaatcac	ttgaaccggg	gaggtggagg	ttgcagttaa	140160
cttagatcac	accactgcac	tccagcctag	caacagagtg	agactctgtc	tcaaaaaaaa	140220
aaaagaatac	ttcagactta	at	ttttttttc	cagtcttaag	tgagattgag	140280
tttcttttgg	tatgtctctt	gattgttcag	gttttttctt	ttatgaattg	actgttcac	140340
tctttttcac	attatttctg	ttgggtgatt	ttattagtga	cttggttaaaa	ttctgtatat	140400
tttttcagca	tgacacttca	ttattcaaaa	aaaaaaaag	attctctatg	tttctcgata	140460
ctaattcattg	gttggtaata	ccttaaaaaat	aagaccctta	ctgtattttt	tgcttttttt	140520
tttttttttt	tttttttttt	tttgagatag	agtcttgctc	tggtgcccag	gctggagtgc	140580
aatggtatga	tctcggtctt	cagctcactg	caactgcaac	ctctacctcc	ctgtttcaag	140640
caattctcct	gccttagcct	cccaagtagc	tggtgattaca	ggcatccacc	accacacca	140700
gctaattttt	gtatttttag	tagagacagg	gtttcaccat	gttggccagg	ctggctcaa	140760
actactggcc	tcaagtgatc	cgctcgctc	ggcatcccaa	agtactggga	ttacaggcat	140820
gagccacagt	gcctagccac	tttttgcttt	tttaactttgt	tttatagtac	tatagtttta	140880
gtataaacag	atgtatgtat	acacacaact	atggctttat	aatatgtttc	agtcattgtt	140940
agagcaaggc	ctaccttttg	ggtgcttctt	ttacaaaatt	gtcttggtta	ttcttggtgc	141000
tttttttcta	tttgtgaatt	ttagaattgt	gaattacctg	ttgactcacc	atgttttcta	141060
aactgaggat	tttgaattgga	attgcactca	attaaagatt	atcttgcttt	ctgtgcagca	141120
atgttttatt	tcaataaatc	cctactttta	attacttagg	atagctataa	attgtgtttc	141180
tggtcttcta	gatttagatg	aaacgcttta	aatttgattgt	tttctcctaa	atttaaaact	141240
gattgttttag	agttaaaagtc	ttctgttcat	tcttatttag	gaagatgaca	tttggaaagag	141300
tcagtgcatt	ggggcaattc	atccgagaat	ctgagcctga	acctgatgta	aggaaatcaa	141360
aaggttttgtg	gtgtttttat	acttcataatt	aagcctttac	tcacattagt	gattgactgt	141420
aagtcaaaga	ccacttaagg	tttaaaactgt	ttattttgta	aagtaaccac	tgatctttc	141480
accttgtgtt	tatagtcaga	agtaagtaca	agggcttctt	gtagtcacat	ctttatgcaa	141540
tctcctctga	atcaaaagtt	agtgaacttg	ctttgccact	ccagaaggca	catgaatatg	141600
aaaaagcatt	gtctattttc	ttattttaatg	gcaaaaatacc	cgacctaaat	tggaactta	141660
gtttgagacc	gtttatttta	ttaaattata	ttttttctct	tttctttttt	ttttttgaga	141720
cagttcttgc	tctgtcacc	agaccggagt	gcagtgggtc	gaccgcacct	cactgcaacc	141780
tctgtctct	aggttcaagc	gattttcctg	cctcatcctc	ctgagttagct	gggactacaa	141840
gtggcgacca	ccacacctgg	ctaatttttg	tatttttagc	agagatgagg	tttcaccacg	141900
ttggctaggc	tggtctcata	ctcctgacct	caagcaatcc	atccgccttg	gcttcccaaa	141960
gtgctgggat	tacaagtgtg	agccaccatg	cctggcctta	ttaaattatt	tttattaaat	142020
ttcctcaaga	ttgatgaaag	taatgaaata	taaaagtaat	gaaatatatg	tggaaaatag	142080
actggattaa	gaaaaatgtg	cacatataca	ccatggatac	tatgcagcca	taaaaaagga	142140
tgagttcatg	tcctttgtag	ggacatggat	gaagctggaa	accatcattc	tgagcaaaact	142200
gtctcaagg	tagaaaacca	aacaccgcat	gctctcactc	ataggtggga	attgaacaat	142260
gagaacactt	ggacacaggg	tggggaacat	cacacgctgg	ggcctgtcgt	ggggtggggg	142320
gtcgggggag	gaatgacatt	aggagatata	cctaataata	atgacgagt	aatgggtgca	142380
gcacaccaac	atggtacatg	tatacatatg	taacaaagct	gcacgttgtg	cacatgtacc	142440
ctagaactta	aagtataata	aat	taaaaaa	atgtggaaaa	tattaatagg	142500
tcaaaattca	aattgttcat	ttaatcagaa	gagtagttta	gtcaaatcca	agggttagac	142560
aacagaaatc	ttttttgtca	agtcattct	ttgtgactga	tttcattttc	ttcctgggtt	142620
acacaggaag	at	caaatgtgga	tccgtgacag	atggtatcta	gaagttttta	142680

56/122

gtttggttga	attgacagta	ttttattgag	taaaagatac	taatttttgt	aagaagaaaa	142740
attcaatttt	gataagtatg	tttaagatta	agagctattg	gccaggcgct	gtggctcatg	142800
cctgtaatcc	tagcactttg	ggaagctgga	gcagggtggg	cacgagggtca	agagattgag	142860
accatcctgg	ccaacatgg	gaaaccctgt	ctctactaaa	ttagccaggc	gtgggtggcac	142920
atgcctgtgc	acccgcctcc	gggtttaagc	gatcctactg	cctcagggtc	ctgagtagct	142980
gggattacag	gcgccatggc	taatttttgc	attttttagta	gagacagggg	ttcactacat	143040
tggccaggct	ggtctggtct	caaactcctg	accacagggtg	atctgcccgc	cttagcctcc	143100
caaagtgtcg	ggattacagg	catgattcac	catgtctggc	catttatctt	attttctttt	143160
tttttttttt	ttttgtttga	gacggagtct	tgctgtgtcg	cccagagctg	gagtgcgaatg	143220
gtgcgatctc	agctcactgc	aacctctgcc	tcctgggttc	aagcaattct	cctgcctcag	143280
tcttccaagt	agctgggatt	acaggcgctg	gccaccacat	ctagctaatt	tttgtatttt	143340
tagtagagac	agggtttcac	catgttggtc	aggctggtct	cggaaactct	gacctcgtaa	143400
tctgcccacc	tcggcctccc	aaagtgtgta	gattacaagt	gtgagccact	gtgccagcc	143460
atcttatttt	ctttcttttt	ttttgtcggg	tgggaggggg	acagagtcta	gctctgtcgc	143520
caggcttggc	tcactgcaac	ctctgcccc	caggttctag	caattattct	gcctcagcct	143580
cccgaagtag	gggtattata	ggcacctgcc	accacggctg	gctaattttt	tggtattttt	143640
agtagagatg	gggttttgct	atgttgacca	tgctggcctc	aagtgatccg	cccaccttgg	143700
cctcccaaa	tactgggctt	acaggcgtga	gcttgtattg	ggtaaaagaa	caatattggg	143760
ggctgcacat	tggttcatat	ctgtaactct	agcactttgt	gagactgaga	tggaaggagt	143820
gttgagagccc	aggaggggtga	ggctgcggct	gcagtgaatt	gtgatcacgc	cattgcactt	143880
ccacctaggt	aatggagcaa	gacctgtct	ctaaaaaaca	aaacacaatt	tttttaagga	143940
atactgggaa	gaggtcagtg	gtggtttttag	aacagaggaa	gtgccagatg	accttttgtga	144000
ggcattggcc	aggaagaact	ctacagtgtc	tttaggtagc	ttctgtccat	aaggataatg	144060
gggtctcctc	cccagtatta	atagaaaatc	tctgagctgt	ttttttttgt	ttgtttgttt	144120
tgtttttttt	tcctgagatg	gagtcctctc	ctgtcggcca	ggctggagtg	ctgtggcgcg	144180
atcttggtc	actgcaagct	ctgcctccca	ggttcacacc	attctcctgc	ctcagcctcc	144240
caagtagctg	ggactacagg	tgteccacc	cacgcccagc	taattttttg	ttattttttg	144300
tagagatggg	gtttaccat	gtcagccagg	atggtctcga	tcctctgacc	tcgtgatccg	144360
ctcgctctcg	ccttgcaaa	tgctggagtt	acaggcgtga	gccaccgtgc	ctggcctggg	144420
ttttttgttg	ttgttattta	tttattttat	tatttttttt	ttgagacaga	ctctcgctct	144480
gtcggccggg	ctggagtgt	gtggcacgat	gtcggtcac	tgcaagctct	gcctgccagg	144540
ttcaagccat	tcctctgcct	cagcctcctg	agtagcagg	accacaggcg	ctcgccacca	144600
cgcccggtta	attttttgta	tttttagaag	agacgggggt	tcaccgcatt	agccaggatg	144660
gtctcgatct	cctgatgtcg	tgatccgccc	acctcgccct	cccaaagtgc	tgggattaca	144720
gggtgtgagcc	accgtgcctg	gcctgatttt	tttttttttt	taatctgggtc	tcatacctct	144780
gacagctcat	gaagaagtgc	tcctgcttca	tatgtatatg	tgtagcata	gtgttaacat	144840
agcataggtg	ttcgggtgtt	gcagtttctg	tggtttttat	atgaattaa	gtgtattatg	144900
agcagttgaa	gatatatagg	aaattttttc	ccaaaccact	atctctgtct	gttctattca	144960
ttcagtcctgt	ttatgttatt	ccttcattca	ttcattttat	agaacagtgg	agtgccctact	145020
gtatgcacat	attgttctgg	gtcctgggga	agaaaacaaa	gttcctgctt	tcattggaact	145080
tacattatat	tggcggagac	agtaacagac	aaacaaatgt	agcctgtgta	catgtgttac	145140
atgaaaagca	gggtaggggg	ctgggagaga	gtagtaggga	gtgctatttt	cgagggtggg	145200
gtcaggaaa	gcctcactga	ggaggtggca	ttttgagtag	acctgagcgc	agcggggggc	145260
taagcccagg	cagcatgtgg	aggaagagtg	ttcttgggtga	aaggaacaag	gatagaggcc	145320
cgaagctaga	gagctcagca	tgatcaagga	acagcaagcc	ccgtgtgggt	ggaatggagt	145380
gagcaaaagg	atgagcagta	gaaggtgagt	gagttgggag	gtcaccagag	accatggcaa	145440
ggacttgaaa	gtgtcaggga	cacattggaa	gttgaggcag	ggaaatgatg	ggatttatgt	145500
tttggttttg	ttttatgttt	agtgttttta	agggattgct	ctatcagcta	tttggaata	145560
ttagtgtagg	gcttcaagaa	gagaagcaga	gaaacaacat	tcttgccata	gtcatagtct	145620
aagtaaggga	tgatggtggt	gtggattagg	ctggtagtgg	aagaccagtc	cagttcgggt	145680
tgtatttgaa	ggtagaggca	aaaagattat	attttctacca	gcaagcccat	ctatgaagtt	145740
acttgtatta	tttaattta	tgagacatgc	ccacataaac	taataaata	gaatttctgc	145800
agtttggtta	aacaccctg	tatatcctgg	ttcttctttt	agttgtccag	atgtctcttt	145860
aagtcaagta	ttttttggtg	gtgtaggagc	ctagagattg	aattttattca	cccaaaaggc	145920
atttgagtga	ttactatgtg	ccaggcacta	tgctgaatgc	caaggatgta	aataagagg	145980
cgtagtctca	gtctgtttta	ctccagcttg	gttccctttt	aatgaccctg	acttggtta	146040
catatcagtt	atccacagaa	atgtttaatc	ctctgtactt	tcctgggtgt	gttatttagc	146100
ttatttctct	ttccttgaca	tttcttgtaa	actggaagtt	acacctatag	tcttgatgat	146160
tcgtgttaca	catttttagat	tagaacacat	catgtgttgt	atatggtgtt	tttgaaagcc	146220
tctctgtata	ttggtctgta	cattaaaatg	ttgcttgaat	ggatacacat	aaaatttaac	146280

57/122

agtgattaca	ttagagatga	gaagaaagag	gtgcctttta	cttttcaata	taccttttcc	146340
tctgcttttt	gaactttctt	gccctatgca	tacgttattg	cttaatcatc	cacctcatct	146400
cttccctgtg	ggctttctgt	tgcatttgga	atgaaatcta	gcctctttgc	tgttacctgt	146460
ggatgtccct	tgctggcctc	tatcacctta	ctttgaacca	ctcctttcat	ggactgagct	146520
ctcattggac	tatcttttat	tcttttgctg	aagtttcttc	actttgagtg	cctctgcagt	146580
tgctatttca	tggtctgggc	aagccctgcc	atggctttca	tgcaaggatg	gttcctcctt	146640
ctcatctcaa	tattatctct	tcagagaggg	accttcccaa	ctccgatgat	ctaaaaatcct	146700
ttgtatatac	cactcactac	cacttctttc	ttttcttttc	cttttatctt	tttttttttt	146760
tttttttttt	gagatagggt	cttgctctgt	tgcccaggct	ggaatcacga	ctcactgcag	146820
cctcatcttc	ttgggctcaa	atgatcctct	cacctcagcc	tctcgagtag	ctggaactgc	146880
aggcacacac	caccatactt	ggcttattat	tttacttttt	gtagagacag	ggtttcacca	146940
aggctggctt	caagctcctg	ccgcaagcaa	tccacatctc	tcagcctccc	aaagtattgg	147000
gattatagga	gtgagccact	actcctggcc	ttctttctta	ttcactgtct	aaaattatct	147060
tgttcattta	tttacatact	tgtttatagc	ttatttctca	gctggacatg	gtgcctcaca	147120
cctgtaatct	caatactttg	ggaggtctgg	ttggagaatt	ggttgagccc	aggacttcaa	147180
gacttaagaa	gtgacccctg	tgagaccctg	tctataaaaa	attgtttaaa	aattagctgg	147240
gcatggtggc	acatgctctg	ggtcccagct	acttgggagg	cagaggtggg	agaatcgctt	147300
gggcccagga	ggttgaggcg	acggtgagcc	atgatttgtc	cactgcactc	tagcctagtg	147360
acagagtggg	accatgtgtc	taaaaaagta	tataactatt	ttctcttttc	atgactagaa	147420
tattacctct	atgtgggcag	ggagtttgtc	ccttaaatat	ggcactatat	ttcctgattc	147480
tgaaattatg	cctagcacat	ggttaagtact	gtggtaagat	ttattgactg	aattatttaa	147540
attgatattt	ggttatttgg	gattatctga	tttgccacac	tacggattat	atttatgtaa	147600
gaaaaaatca	tttttttaaac	ttggttgccc	agaggccatt	tgacatagac	actaagtttt	147660
cttagccaga	ttacttccga	ggatactcac	gcaatttcta	ctcttctcaa	tccccaataa	147720
tgcccaacat	gttagcactt	tcagactaat	aagtctgggc	gatgatgtat	ctgtgtatat	147780
catatcctca	ttctacaaat	gtagaaattg	gatcactgag	acagtggctc	tcacctgtaa	147840
tctcagcagt	ttgggaggcc	aaggcgagcg	ataaaatacaa	gacaagagtt	aagaccagcc	147900
tgcccaacat	ggttaaagcct	tgctcttatt	agggccaaggc	caattagggc	cgggcggtgt	147960
ggctcacgcc	tataatccca	gcacgttggg	aaccccatct	aggcagatca	cgaggtcagg	148020
agttcgagac	catcctggct	aacacagtg	cccagctatc	ctactaaaaa	tacaaaaaat	148080
tagccaggca	tggtggcacg	cgcttgtagt	ccagctatc	gggaggctga	ggcaggtgaa	148140
tcccttgaa	ccgggaggcg	gaggttgcaa	tgagctgaga	ttgcaccgct	gaactccagc	148200
ctggtcaaca	gagggagact	ctgtctcaaa	aaaaaaaaaa	aaaaacaatt	agccaggcgt	148260
ggtggcgggt	acgagtacct	gtaatcccag	ctactaggga	ggctgagggg	ggagaatcac	148320
ttaaacccag	gaggtggagt	ttgcagcggg	ctgataatgc	accactacat	tccagcctgg	148380
gcaacagagt	gagactctgt	cttaaaaaaa	aaaaaaaagaa	agaaagaaat	tgaggaaatg	148440
ggagattgtg	gtctgtgatt	cacacagcag	gttagtagca	gttagtagca	actacagggc	148500
tttggttcag	aataccacct	tgacaatggt	ttgtttacag	ttcggctccc	cttctctctg	148560
ctttctctcc	ttccttattg	agggcagctg	gaaagaattt	tcattcattt	ctagcctata	148620
gctttaattt	gagttttgaa	accttgataa	tagagcacag	aggaaaagac	tgagttttct	148680
ttttttgaga	cagtcttgct	ctatggccca	ggctggagtg	cagtgcacac	atctcagctg	148740
ggtgcaacct	ctgcctccca	ggttcaagca	attctgcctc	agcctctcga	gtagctgaga	148800
ttacaggcac	gtgtcaccac	gcccagctaa	ttttctgttt	ttgtttcggt	ttgttttttt	148860
ctgagatgga	gtcttgctct	gtcaccagag	ctggagtgca	gtggtgcgat	gttggctcac	148920
tcaaacctct	gtctcctggg	ttcaagcaat	tcttctgcct	cagcctcccc	agtagctggg	148980
actacaggta	cgtgccacca	tccctagttc	atttttgtat	gtttagtaga	gatgggggtt	149040
cactatgttg	accaggctgg	tctcgaactc	ctgatctcag	gtgatctact	cgtctcagtt	149100
tcccaaagtg	ctgggattat	tggcacacgc	ctatttttgt	atttttagta	gagacggggg	149160
ttcaccatgt	tggttagact	ggtctcaaac	ttctgacctc	aagtgatttg	cccgcgccag	149220
cctcccaaag	tgctgggatt	acaggcgtga	gccaccgtgc	ccagccaaga	ttgagttttg	149280
aaaagagcct	tctgagatta	tgagaagggc	aagcaagata	acttaagaag	ttacattaaa	149340
atcatctaag	agacagtgtg	acaagaagga	attgtaaaaa	gatgttatga	gcacgtgccc	149400
aatgtagtgg	caatcccttg	tgcttcgata	cattggtggg	agacaaaact	gtacttaaat	149460
tgataaatcc	cttaccatgtc	attttaagga	gcttagactg	actcccatca	tgtagacatc	149520
agagatttct	tttttttttt	tttttttttt	tttttttttt	tttgtgacag	agtttttgct	149580
ttgttgccga	ggctggagtg	caatggcgctg	atctcggctc	accacaacct	ccacctccca	149640
ggttcaagca	attctcctgc	ctcagcctcc	cgagtagctg	ggattacagc	catgcaccac	149700
cacgctctgg	taattttgta	tttttagtag	agacgggggt	tctccatgtt	gtggctgggt	149760
tcgaactcct	gacctcaggt	gatcctcccg	cctcagccac	ccaaagtctt	gaaattacag	149820
gcgtgagcca	ccgcgcccag	cccagagatt	tctaaacaga	gttctaacca	gatgcttttc	149880

58/122

cctgtcagta	gaatgagaat	gaattggagg	tgggagagac	tggcatgagg	gacaccagtc	149940
agccagtgga	attagctggg	aatgttgata	ggagaagaaa	aagattcaaa	gttaggtagt	150000
ggtagcaaga	attagaggga	aggtcggatt	tatgatatgt	ccaaggttga	attctaaagg	150060
gaaatttggg	ggcagatttc	atgtgtaaat	tgggaaggta	gattgagttt	ttttaacatg	150120
ggttttctaa	catgtcaata	gagtgaactc	gcaggggggc	ctgacgagag	aacagtgcac	150180
gggggtattc	aacagccagt	tgagccttca	tgcagagcat	ttaacactgt	gactctgtag	150240
actctgggtg	gcagtaaaat	ttcatataac	caatatttaa	acccttaggt	aataataaaa	150300
attgagggaa	aaggatccag	gttttgatt	ttttatgaat	tcagttattg	aattaaacag	150360
gaccttgcc	caagaaataa	tctaccaaca	attaacttgt	tttaaagcaa	agttaggaag	150420
tgagcatggt	caaattatta	aataaaaaag	taagctgtgt	atttcattca	tagaaataga	150480
ggctggccta	cttcggatga	ttctcagcat	gtgattacag	atgtgggctt	atacatccta	150540
gggagttaag	gcgtactctg	gcttgatag	agtagagctc	tttgaaactc	ttctctcacc	150600
cagctagttt	atatagacta	gagaactaga	atctagcagc	atactctgtc	ttagaagccc	150660
ttttatatag	gagctgggtc	ggaagggttg	aaaacataac	aatgtgtgtg	gtgtctccca	150720
atgtattgct	agattcttac	ccaagagcat	tatcctgggt	aggggttggt	ttgggtttgt	150780
tttgtttttt	actgtttggc	acaaactaac	actagatgtt	agttctttca	tcaagtggag	150840
agagtagaag	aaaagtccag	aactctgaaa	caccttttca	aaagtttttc	aagccatgat	150900
gtttgcaagt	taaatgctct	gttatgtaag	caatataatc	agtttttatt	aatgtaacat	150960
tccttagtgt	tttgggggtat	cacacaaaaa	agaatatcca	tatctggaag	caacagcttt	151020
taaatgaag	catttgtggtg	gtggtggtga	tagtggtttt	tttttttttt	tttgagttgg	151080
agtctcgctc	tggtgcccag	gttggaggtg	agtggcacga	tctcagctcg	cttcaacctc	151140
tgctcccagg	ttcaagcaat	tcttctgcct	cagcctcctg	agtagctggg	attataggca	151200
cctgtaccac	tgcttggtcg	atttttatta	tttttagtaga	gacaggtttc	accatgttgg	151260
ccaggctggg	cttgaactct	taacctcagg	tgaatcaccc	acctcgccct	cccaaagtgc	151320
ttctctgtta	ggcatggaac	accatggcca	gccaataaag	agcattttta	atgtaaaaat	151380
atgcatgaaa	tgtacattca	attttgtctt	tgtttactag	gatccatgtt	ctcacaaagt	151440
atgaagaaat	gggtgcaagg	aaatactgat	gaggtaaatc	ctacctttag	gataaaaaaga	151500
ttctctgtta	taagtgccac	cctcatgtaa	gtgagggtta	aaattttcct	tttcttttagg	151560
tcccatgttt	aagcagcatg	gcacatttat	gttctcttac	ccagaatgta	ccaagaaagg	151620
gtggtccctt	cttaacatct	aacaattgcc	tggtagtagc	agtgaaggta	tcttcagtca	151680
gaggctagga	ccactgaagg	atatacatgc	attcaagttt	ccatcagcca	gcaggcatca	151740
gtaatcagtg	tgtagatcaa	aagctcaaat	gtttctcttc	ccactggcag	ttttacttca	151800
agtagtgagg	gcttgctttt	ttaatagtta	attaagtaca	ttgagagatg	ggaggtgaaa	151860
aaaggaaaaat	gtttttatttt	gaccatctaa	tatgaaagta	gttcggtggt	aggtatccag	151920
tagttgacac	tgggaagacag	ggaatgacat	gttaatatct	atagccagag	ggtggcccag	151980
gttttttcgt	acatgggaat	gaaattctta	tccaaataag	tagaaattat	gtgcgtaagc	152040
catttggtta	gagcactgag	tatgtgcac	tcgatccatc	taatgaataa	ccattatcac	152100
cagtttaaat	tattttcttt	aggcccagga	agagctagct	tgggaagattg	ctaaaatgat	152160
agtcagtgac	attatgcagc	aggctcagta	tgatcaaccg	ttagagaaat	ctacaaaggt	152220
aaggatgact	tcgtttttgtg	taaaactaaa	agtattattt	tccaggtgta	aaaaataaaa	152280
agaacataag	gggtttcttt	gcctttgaag	gattaactgc	tgtggggatt	accttcttat	152340
cataagcaac	tagaaaaattg	acaaactaaa	tgaacaactc	gtttgcatat	attggacaat	152400
gggcaataca	gggaaaccat	ggaaaccaaa	cagagcccag	tagtcttgct	gaacgaaaaga	152460
gttaaatatc	aaagttcagg	ccaggtgcag	tggctcacgc	ctgtaatccc	agcactttgg	152520
gaggccaagg	cgggtgaatc	acttgaggtc	aggagttcaa	gaccagcctg	gccaacatgg	152580
tgaaccctcg	tcttagccgg	gtgtggtggc	aggcacctgt	aatcccaact	atttggggag	152640
ctgaggcagg	agaatcgctt	gaaccaggga	ggcggagggt	gcagtgaacc	gagatcacac	152700
cactgcactc	cagcctgggc	gacgagcgaa	acccattttc	aaaaaaaaaa	tcaaagttca	152760
gagagctcaa	tttgagtaga	agttgtagga	taaggtagca	gaaaagagga	agctgcccag	152820
aaagaaagcc	gtagagatat	ttagagagat	tcccatggat	ccttggccta	ggagtgatct	152880
gtatatgtgt	ggggtgaaaa	cgcagtgtgc	caggtagaga	accccccaga	aattagtagg	152940
ctgaatgatt	gctggaacat	agggttaaga	aaagttcatg	gccagaagga	tctggccaga	153000
gtagagagac	ttagtaatac	acaaggcatt	gggtagtgtc	ttcacagagg	ttatgcctta	153060
ctactgaaga	taaattagtc	ctagagtaca	agcacctgaa	ccaagtttca	aagcaaattt	153120
ttaaagggtc	aaattaccta	acaactgcat	gccaaaacaa	aggcctaacc	ctctttacag	153180
taacacaaca	aaattcagca	cttcacagtg	taaagttaga	atgtctgacg	tccaggctgg	153240
gcgcagtggt	tcatgcctgt	aatcccagca	ctttggggag	ccgagggcag	tagatgacct	153300
gaggtcagga	ttccaagacc	agcctggcta	acatggtgca	acccgtctc	tattaaaaat	153360
acaaaaactt	agccaggcat	ggtggccggc	acctgtgatc	ccggctactt	gggaggctga	153420
ggcaggagaa	ttgcctgaac	ccaggagggtg	aaggttcgag	tgagccgaga	tgcgaccact	153480

59/122

gcactctggt	ctggggcaaaa	agagcaaaaac	tcaggctcaa	aaaaaaaaaa	gaatgtctga	153540
cgatcaatcac	aaattacca	gcatgacatg	aagttgacct	ataaccagga	gaaaactcaa	153600
tctatagaaa	cagaccagga	tgtgagaaag	atgatgaatt	tagcagacaa	agaccatcaa	153660
gtggctattt	taaatatcaa	aaatatgttc	aagtggccag	gtgcagtggc	tcatgcctgt	153720
aatcccgca	ctttgggagg	ccaaggtggg	taggagttca	agaccagctt	ggccaatatg	153780
gtgaaacccc	ttctctacta	aaaatacaaa	aaaattagct	gggcatggtg	gcaggtgcct	153840
atagtcctcag	ctatatggga	ggctgaggca	caagaatcac	ttgaaccggg	gaggtggagg	153900
ttgaggttgc	agtaagccga	gattgtgcca	cttgactacc	agcctggaca	acagagtggg	153960
actctgtctc	aaaaaaaaaa	aaaaaaaaag	taaagaaaac	aagagtataa	tgagaaaaat	154020
gcaaaatagt	tttaaaagaa	ccaaatggaa	tttcttaaaa	taaaaaatac	cagaaatggg	154080
ggccggggcgt	ggtagctcac	gtctataatc	ccagcacttt	gtgggggctg	aggcaggcag	154140
atcacctgag	atcggtagtt	caaggccagc	ctgaccaaca	tggagaaacc	tcatctctac	154200
taaaaataca	aaattagctg	ggcgtggtgg	ggcattgcct	gtaatcccag	ctacttggga	154260
ggctgaggca	ggagaattgc	ttgaaccggg	gagggcagagg	ttgctggtgag	ctgagattgc	154320
accagtgcac	tccagcttgg	gccacaagag	tgaacctccg	tctcaaaaaa	aaaacaaaaa	154380
aaaacagtag	ctgcgaagaa	ctagctgagt	ttttctttac	tttaggcagt	aagtgtgacc	154440
ttttgcagg	gactacttta	gttcctcatg	tcctcattag	tagatcagag	aaattcgaca	154500
ccaaaacccc	aaaagaaaaa	ccccttctaa	tcctcattcc	atgattttat	gaatgcata	154560
agtcctaggc	atctcgaagga	atactcattc	ctttatccct	gtgttgatac	ctctctgctt	154620
caacctccaa	ctcgacattt	gcctatagga	tgtacttgga	cattcagcat	aaactacctc	154680
acaccattac	tgaattgtct	catgtgcaca	tgtcccatgc	cacaataccg	gggaccttgt	154740
cttccgtgat	agtcgtccgc	agtgctgtga	ctacaggagg	gagtcagtga	atgtctgcat	154800
gtgtgtcttt	accatccctc	ttgaatatgc	tctagggtta	attcctagaa	gtagaattac	154860
tctattgaaa	attggcaata	tttttctatt	taatatctat	tgccaacatg	ggaaagcaag	154920
tctggatgcc	atctcattgt	atagtcctct	tggttaagtt	acgtaacctc	tttaagcttc	154980
tgttcactca	tattttaaca	aggaaaatta	caatttttta	cctcacaaaa	ttgtagttag	155040
cttctggctg	tcttaaaact	tggtatatag	taaacactaa	gtgttggtgt	ccatccttaa	155100
tttgtataaa	taggtcactt	gttagagaaa	tgcaccttac	cattttcttt	tcttttcttt	155160
tttcagttat	gactcaaaac	ttgagataaa	ggaaatctgc	ttgtgaaaaa	taagagaact	155220
tttttccctt	ggttggattc	ttcaacacag	ccaatgaaaa	cagcactata	tttctgatct	155280
gtcactggtg	tttccaggag	agaatgggag	acaatcctag	acttccacca	taatgcagtt	155340
acctgtaggc	ataattgatg	cacatgatgt	tcacacagtg	agagtcttaa	agatacaaaa	155400
tggtattggt	tacattacta	gaaaattatt	agttttccaa	tggcaataac	ccattttatga	155460
gagtgtttta	gcctactgga	atagacaggg	accacatcct	ctgggaagca	gataagcata	155520
gaactgatac	ttgatgcaca	ctcgtagtgg	taactcatcc	ctaactcagca	ttgtaagca	155580
ggtgccagag	gtgggtttgt	ttgtccttcc	aaagcagggtg	agtcagcccc	accgagagcc	155640
aggcagcttt	gagtggcagc	gtgggtgctag	cagcttcagc	ggaacagggtg	gagagttaat	155700
tatgcagtct	tcttgacagc	ggcattaatt	tggaaaggaaa	ctgacaagtc	atgggtcaag	155760
tttcagtgc	ttcctccttc	ctctgatggc	agtatatagt	tttcacattt	taattcctcc	155820
tcttgagatg	cactataact	aaaaccattc	tctcccctgc	taacagaagg	gtgtgaatct	155880
ggtttacttt	gagcattagg	atttgccctt	ttggaattct	gcactccagt	tacttaactt	155940
tcccttcaga	atacatgtgg	aaagaaagaa	agaaatagcg	atgactccac	ttttgcccct	156000
gtggcacctt	gaacaaagca	gttcttccca	aattatactt	tttttttttt	taaataaggt	156060
gagcaggatg	actggggaga	gagaaacatt	tgactttgac	tgccctcccc	attctttgct	156120
gtgagctgga	aagtgtgcag	ttggtcgtct	ttcttctcct	ttcttttagga	tagtaagaga	156180
ctcactcact	gcacttctgc	tcagtgggtc	tctgcactcg	gatcacacag	ccatcagcag	156240
gactgcccag	ttggtgagca	cactccattg	accacgtggc	gccagcgctt	cctcaatgca	156300
catgattgag	aggaaagaaa	gttctcttag	atgttactgc	ttttgctcag	actttgcata	156360
aaaaaaaaata	tatatata	tgtataaata	tataattatt	aatcactttt	gtccttgaga	156420
aagtcttgaa	tgaacagaga	atttattcca	ttgcaatatt	tgattgtata	gaggcacact	156480
gtttcatcga	cagaagaagc	aaaaaggctt	tgtgtgaagt	tttggtagta	tgtaccacct	156540
ctgttattct	tttaaagctg	aagtattcat	gtacttaaac	catattatat	tttaattgtgt	156600
ttgattttaa	aatatatata	tatgaattct	attttaaatt	gtgtcaactt	tctgctttca	156660
gggcatttat	ggctcttctg	ttgaaatata	ttgatctttc	caaataattt	catttgcttt	156720
ctaaaaaccc	agaacatgag	ccactactgg	actttgcctt	gtgtttgaag	tgtatggcat	156780
aaacccaagg	tttttattag	tcactctatg	tgtgattaat	tcattttgtt	cttttaacaa	156840
aatattttcca	tccacttcac	attgcttcaa	tctttaacag	aaaagcaata	taaagggtat	156900
agaataaaat	gtgggttttg	gcaactcttg	ctgcctctgc	atgttttggg	ataacaattt	156960
ctacaagact	ctaggctggt	taaactagt	ctttcagtta	agataaaatc	taatcatttc	157020
tttgtatata	cattttgtgc	ttctgagcta	gagatgcaaa	gtagttgtaa	actgcttata	157080

60/122

aagagaatag	cagcaaat	gagactcg	tacttttt	tgccccac	gctttgag	157140
acagaagcg	agtgtggc	gaaattatta	gccagatt	atatttgat	taaagtag	157200
ccttgactc	attttaaag	tggaaattga	ttcctcca	attgagcac	caccatgt	157260
caggctctg	gcattgtgc	cacaaaata	gattccctg	tggaagttt	atgggttaa	157320
ataatcagt	gaacaccct	catctttat	atgttgttg	cattgacac	aattgttta	157380
aaagaaaag	tattagagag	aaagtggtag	ccttgtaac	tgatgtgtc	tcatcatcg	157440
gtaagattg	atgaaagtaa	aaagcaaat	tcagccaa	ccagtgaac	gcaataaac	157500
agggagta	ttttataac	tttttctac	tggatttca	cattcagta	agcttttcg	157560
aatgtaag	gtttacagta	ctggagggt	gactagttc	gtaggaatt	ggaggggag	157620
gtcattctg	attgtaacaa	agtacaaac	tctttgctg	tttattta	tactgagag	157680
taagcacct	atgaagtga	tgacctctc	ccagtgaac	tggttggtg	cctgcctga	157740
ttcaggagt	gggtttatg	ttctacacag	tgacctttc	tctcgccct	tcctccctc	157800
tgccccaca	ccagtgtg	ggacctggg	tgaactcct	atccagacag	gccccagac	157860
gttcttaag	ttagaattt	tggggccgg	cacgggtgg	catgcctgt	attgcaaac	157920
tttgggagg	cgagacagg	ggatcactg	aggtcaggg	ttcgaggcca	gcctggcca	157980
catggtgaa	ccctgtctt	actaaaaat	ctgggcatg	ctgggcatg	tgccgcacg	158040
ctgtaatcc	agctacgtg	gtggctgag	caggggaat	gcttgaacc	ggaggcggg	158100
gttgtcaat	gagccgagac	cggtgcact	cattccagc	tggttgacag	agggagact	158160
tgctccaaa	aataaaaaa	agaaaaag	ttttgggct	ggtgcagtg	ctcacgcct	158220
taattacag	attttgga	gccccagat	ggcagatca	ttgaggacag	gagttcgag	158280
ccagcctgg	caacatggg	aaactccat	tctactaaa	agacaaaag	tagccagat	158340
tggtgatgg	cacctata	cctagctct	cggaaggct	gggcaggag	atcactgaa	158400
cccaggaag	agagattgc	gtgagcca	atcacatct	tgactccag	cctgggca	158460
agagcaag	ttgtctcaa	aaaaaaaag	atgtggccg	gcgcagtgg	tcacgcctg	158520
aatccacag	ctttgggag	ccaaggcag	cagatcacg	ggtcaggag	tcgagattg	158580
cctggcta	atggtgaa	cctgtctct	ctaaaaaac	aaaaacatt	ccgggtgtg	158640
tggtggcac	ctgtagtcc	agctactag	gaggtcagg	cagaggaag	atgtgaacc	158700
aggaggcga	gttgacagta	agccaagat	gtgccactg	actacagt	ggcgacaga	158760
gtgagactc	gtctcaaaaa	aaaaaagaa	tttggccgg	tgccgtggc	catgcctgt	158820
gtcccagca	tttgggagac	caaagtggg	ggattacct	aggtcaggag	ttcaagacca	158880
gtccggcca	tctggcgaa	ccctgtctc	tactaaaaa	aatacaaaa	ttagccagg	158940
gtggtggcg	gcacctggg	aggctgagg	agggagaaa	gcttgaacc	gggaggcag	159000
gggtgcagta	agccaagat	gtgccactg	actccagag	aagactctt	ctcaaaaaa	159060
aaaaaaaag	aatgttgc	ggggaagg	agatctgt	caccatctg	aatggtgtt	159120
ggatgtggc	cttacaata	caggagccg	cactgcatt	acaaacaga	gcatgtggg	159180
ctgagatag	aggtacctg	ataaccctg	agacatcct	ggtttctgc	tctattcct	159240
catccttgc	ttggactaca	ttaactctg	agttatcct	ataatgatt	ttgattttt	159300
ttttttgag	tggagtttc	ctctgttgc	ccaggctgg	gtgcaatgg	acgatctcg	159360
ctcaccaca	cctccacct	ccaggtcaa	gtgattctg	tgccctcag	tcttgagta	159420
ctgggattac	aggcatggc	caccacacct	ggctaattt	gtatttttag	tagagacgg	159480
gtttctccat	gttggctcag	ctggtctcg	actcccaac	tcagggtat	accctgtct	159540
ggcctccca	agtgtggga	ttacaggcg	aagccatgg	accgggtct	ttttttgat	159600
ttttgaaac	agtctgaag	gagtttttt	aattacgtg	aaggagttt	gctaaaata	159660
tgccatact	ccctaattg	taatgattat	gtattctcag	catgtctgc	aagtactgt	159720
gatttctgga	gaataattt	tctttagtaa	acttcaact	agtcgtcat	tgtattctc	159780
caaaatggt	tactaaccta	atggagctaa	aagacaccc	ttgtttttat	aacaagcag	159840
tactgaggcc	caggaagggg	agaagtccct	ggcttgtgag	atgatcacca	ttagaactca	159900
ggcctgggg	agtgccttt	catgtctct	agatccttc	aaagaataat	gaagattata	159960
accgctttta	gcaattgtaa	taaaaccaga	aatagaaag	tttttgggt	gagtagtgt	160020
agaagtgtg	cgggagagat	aattttttaca	aaatttgtta	atacctgcca	attctatata	160080
ctaggcaagg	tctctggcct	tgtaaaaacc	ctcaagggt	caactttggt	ggccccact	160140
aatagttacc	cactagggcc	ctctccgggt	gaacattgag	cactagagga	agccctctg	160200
cttgggcagg	actgggcgtg	gtgcagagta	ggagcgggt	tactgtggat	tctgggcagg	160260
tgagagatg	cagtgtgtc	caataaagg	cactggagg	agcagtgtg	gtaaaggccc	160320
tgagggcatt	catgttccag	gaggttgtct	gccactggc	ttgcttggc	cacaggagag	160380
tggttattcc	tgcccttagta	actttatgta	aacaagtatt	tctcagctc	gttccctca	160440
aaactgcctg	tctggcacat	tcagaatgtc	acagaactca	cctggatgca	ttcagccct	160500
tgcttaagg	tgacagtga	tctcctccc	cacccaccc	ctcataccac	tgaagcacct	160560
gtcagactgg	ccagttctgt	gggcaaggag	cctagagagg	gcttagtttc	agcttgaaag	160620
gagctgggat	ttaccaagaa	gcaaatgaga	gacgaggatt	gcaacaactg	tgccatttcc	160680

61/122

ccagcttcag	ctgactcctg	tatatgtact	gtgccttcag	actcatccgt	aagtgacccc	160740
aggctggcct	ctccacatc	acagtaagaa	ttccacacac	catacaactt	ggaaagaggc	160800
tccagctgaa	ggaagcccca	cacttctttc	aagtttttct	tagtcttctc	ttcttggcaa	160860
agagtacctt	ttgtttcttc	taattatgta	actattgggt	tagtaaatat	tcacccattc	160920
agtcacccctg	taagtggcag	gcactgttta	cagggacaca	ggaaggaata	aaaacttgca	160980
ggcaccttgg	agcttgcatt	ctattgaaga	ggtaatggaa	gttgggtag	cagctaaact	161040
atgctgggtat	tggccaggcg	cagtggctca	cacctgtaat	cccagcactt	tggaggccaa	161100
ggtgggcaga	tcatgaagtc	aggagatcga	gaccatcctg	gctaacatgg	tgaaccccg	161160
tctctactaa	aagtaaaaaa	aaaaattagc	caggtgtgggt	ggcgggccc	tgtagtccca	161220
gctacttggg	aggctgaggc	aggagaatgg	tgtgaaccca	ggaggcgaag	attgcagtga	161280
gccgagatgg	caccactgca	ctccagcctg	ggtgacagag	cgagactctg	tctcagaaaa	161340
aaaaaatatg	ctggtagttt	tgaattcaaga	tggccttttg	agcccatgat	ttaggtctcg	161400
taccaccaa	ggcttactgg	aaaacatcag	gctctcctgc	tatagacca	tagggagagc	161460
tgcagccgag	agggggagct	gaagagaagt	gccccctctg	tgtcctgtca	gcctcatcct	161520
tccgcaagga	ccagttgctg	tgcactcca	ttcacttgct	gcaagactgg	aggtttttcc	161580
tcaggtgttg	agcactgggt	ttacaagatg	tcagcatctt	gatgcctgag	accatcaagg	161640
caagtctctg	aacagggtct	accttagagt	aaggcttaga	agaggccgta	aagtcagttc	161700
cagctccgtg	gctctgcaga	gctttgggac	atgtgaattc	ttaaaaacaa	gactattgta	161760
cagttactat	atgcatgcag	tataaaatta	taaccttgga	aaatcctagc	tagctgttga	161820
gctaattcca	taaagtaatc	agctcctgag	ttctgcagtg	gtaataataa	tcagcataat	161880
gagtaaacac	tgtgtgtgcc	aggcagcgtc	tcatttgatc	cttgtgataa	tcttgaagt	161940
actgattttc	tcccttcttt	aaacaaagtt	ttttttttt	ttttagagag	ggtctcacta	162000
tgttggccag	gctagtcttg	aattc				162025

<210> 36

<211> 162025

<212> DNA

<213> Homo Sapien

<220>

<221> mutation

<222> 156,277

<223> Nucleotide Base Change: T to C

<400> 36

gaattcctat	ttcaaaagaa	acaaatgggc	caagtatggt	ggctcatacc	tgtaatccca	60
gcactttggg	aggccgaggt	gagtggttca	cttgaggtca	ggagttccag	gccagtcctgg	120
ccaacatggt	gaaacactgt	ctctactaaa	aatacaaaaa	ttagccgggc	gtggtggcgg	180
gcacctgtaa	tcccagctac	tcaggaggct	gaggcaggag	aattgcttga	acctgggaga	240
tggaggttgc	agtgagccga	gatcgcgcga	ctgctctcca	gcctgggtgg	cagagtgaga	300
ctctgtctca	aaaagaaaca	aagaaataaa	tgaacaatt	ttgttcacat	atatttcaca	360
aatttgaat	gttaaaggta	ttatggtcac	tgatatcctg	tttcattctt	tatataatca	420
ttaaagttga	aatgtatact	tgcactacta	acacagtagt	taatcttagt	cctacaagtt	480
actgctttta	cacaatatat	tttcgtaata	tgtatgcact	ggtgtttatg	tacgtgttta	540
tgtttatata	tgttaaaatt	agcagtttcc	atctttttct	attttgtacc	atcacatcag	600
ttcagaagga	ttgacagagc	aaaatgattt	gatgaagtat	aaaagtccca	tgggtgagtg	660
cataaataca	actctgaaca	attaggaggc	tcactattga	ctggaactaa	actgcaagcc	720
agaaagacac	atatacctata	tgtcaagaga	tgtaccaccc	aggcagttaa	agaagggaag	780
tacacataga	aagcacaatg	gtgaataatt	aaaaaattgg	aatttatcag	acactggatt	840
catttggctcc	taaagtcaga	gtcctctatt	gtttttttgt	ttttgtgggt	ttctttttta	900
atttttttat	ttttttaga	gtcggagctc	cactgtgtta	cccgggctgg	tctagaactc	960
ctggcctcaa	acaaacctcc	tgcctcagct	tcccaagca	ttgggattac	agacatgagc	1020
cactgagccc	agcccagacg	ctttagcatt	tatgaagctt	ctgaaatagt	tgtagaaacc	1080
gcataagctt	tccatgtcac	tttcaaagtt	tgatggctct	tttagtaaac	caaccaagtt	1140
attctcctca	ggcaaaataa	catttctcag	tgcaaaactg	atgcacttca	ttaccaaaag	1200
gaaaagacca	caactataga	ggcgtcattg	aaagctgcac	tcttcagagg	ccaaaaaaaa	1260
aggtacaaac	acatactaata	ggaacattct	ttagcaagagc	cccaaagtta	atgataaaca	1320
ttttcatcaa	agagaaaaga	gaacaagggt	ttagcaaat	cctctatcaa	ataacactaa	1380
acatcaagga	acatcaatgg	catgccatgt	ggaagaggaa	gtgctagctc	atgtacaaac	1440
cagtagataa	tttcaacttg	ctgccgaatg	aaacctctt	gcaaggtagt	aatcagcact	1500

62/122

tctcatgttt	gttttgcttt	gttttgcttt	gttttttagag	acaggccctt	gctctgtcac	1560
acaggctgga	gtgcagtggc	acgatcagag	ctcactgcaa	cctgaaactc	ctgggctcaa	1620
gggatcctcc	tgcccttagcc	tcccaagtag	ctgggactac	aggcccacca	tgcccagcta	1680
attttttaaa	ttttctatag	agatgggac	tcactagcac	ctttcatgtt	tgatgttcat	1740
atacaacgac	caaggtacaa	tgtggaaaag	ggtctcaggg	atctaaagtg	aaggaggacc	1800
agaaagaaaa	gggggtgcta	catagagtag	aagaagtgtc	acttcatgcc	agtctacaac	1860
actgctgttt	tcctcagagc	agagttgatg	atctaaatca	gggggtccca	acccccagtt	1920
catagcctgt	taggaaccgg	gccacacagc	aggaggtgag	caataggcaa	gcgagcatta	1980
ccacctgggc	ttcacctccc	gtcagatcag	tgatgtcatt	agattctcat	aggacctaga	2040
accctattgt	gaactgagca	tgcaagggat	gtaggttttc	cgctctttat	gagactctaa	2100
tgccggaaga	tctgtcactg	tcttccatca	ccctgagatg	ggaacatcta	gttgagaggaa	2160
aacaacctca	gggctcccat	tgattctata	ttacagttag	ttgtatcatt	atttcattct	2220
atattacaat	gtaataataa	tagaaaataa	ggcacaatag	gccaggcgtg	gtggctcaca	2280
cctgtaatcc	cagcacttcg	ggaggccaag	gcaggcggat	cacgaggtca	ggagatcgag	2340
accatcctgg	ctaaaaacgg	gaaaccccg	ctactaaaaa	ttcaaaaaaa	aattagccgg	2400
gtgtggtggt	gggcacactgt	agtcccagct	actcgagagg	ctgaggcagg	agaatggtgt	2460
gaacctggga	ggcagagctt	gaggtaaagg	gagatcacgc	cactgcactc	cagcctgggc	2520
gacagagcga	tactctgtct	caaaaaaaaa	aaaaaaaaaa	aaagaaataa	agtgaacaat	2580
aaatgtaagt	tggtggaatc	attccaaaac	aatcccccca	ccccagttca	cggaaaaaatt	2640
ctcccacaaa	accagtcctt	ggtgccaaaa	agggtgggga	ccgctaattc	aaataatcta	2700
atcttcatct	aatgtcaaaa	aatgaataaa	ctttttttta	aatacacggg	ctcactttgt	2760
tgccccaggct	ggagtaacgg	ggcatgatca	cagctcactg	tagcctcaat	cacccaggcc	2820
ccagcgatcc	ttccaccta	acttcctgag	tagctgggac	tacaggcagc	caccaccatg	2880
cccagcta	ttttaaattt	tttatagaga	tgggggtctc	accatgttgc	ccagactggg	2940
ctcaaacctt	gggctcaagt	gatcctccct	caaactcctg	gactcaagtg	atcctccttc	3000
cttggcctcc	caaagtgtcg	ggattacaag	catgagccac	tgtaccagc	tggataaaca	3060
ttttaagtgc	cactacagtc	atggacaatc	aggcttttca	acatgcagta	tggacagtga	3120
gtcccagggt	ctgcttttcc	atactgaaat	acatgtgata	ctaaggagaa	agggtgctcg	3180
aaggatattt	aaaatgaaga	atatttaaaa	tgaggaaaaa	actgtttctt	catgactttg	3240
ataaggctga	taaagaccat	ttctgtgatc	tcagggtgatt	cactcaagta	gtatatttca	3300
gtaatcat	tctggaacag	cctgaatcct	aacaaaaata	ccatgatttt	ttaatgctgt	3360
tatgatacct	tgatgatatg	accaaactgc	aatgtaggca	gctaaatctc	cacgagtttg	3420
acttccccga	gagtgacag	ttttcttcac	aaatataaga	aataatattt	ttgatacatg	3480
attggcatat	ttaaaaacta	cactgaaatg	ctgcaaaatg	atataaagaa	acattttcca	3540
gaatcaaatg	caatcaaaag	gtggattagg	aatctactca	ccattatcaa	ctaaatagaa	3600
acacttggag	tggtgtggtg	ggctcacatc	tgtaatctca	gcactttggg	aggccaaggc	3660
agggtgattg	cttgaggcca	ggagctcaag	accagcctga	gcaacatagc	aaaactctgt	3720
ctctacaaaa	aaaaaaaaaa	attaaccagg	catggtggca	gatgcttgta	atcccagcta	3780
ctctggaagc	tgaagtagga	ggactgcttg	agcccaggag	atcaagactg	cagtgaagccg	3840
tggtcatgct	ggccacagc	ctgagtgaca	gagagagacc	ctgtctcaaa	aacaaaaaca	3900
aacaaaaaac	acttaacctt	cctgtttttt	gctgttgttg	ttgttgtttg	tttgttttga	3960
gatggagtct	cactctgttg	cccaggctgg	agtgcagtgg	cgatgctctg	gctcactgca	4020
agctctgcct	cccgggttca	cgccattctc	ctgcctcagc	ctcccagta	gctgggacta	4080
taggcgcccg	ccaccacgcc	cggctacttt	tttgcatttt	tagtagagat	gggggttcac	4140
cgtgttagcc	aggatgggtc	tgatctcctg	acctcgtgat	ccactgcctt	cggcctccca	4200
aagtgtggg	attacaggca	tgagccaccg	cacccggcca	acctttctgt	tttttagttt	4260
gatatgcttg	ttaactcagc	agctgaaaga	atgctgaaag	tggccttcag	taaaaaaatt	4320
tcactagaat	ctctacatcc	atatttaatc	tgaatgcata	tccagattga	tcagtttagag	4380
caaaaacact	catcatcatt	cctgatgacc	tctaattctg	gtttcggctt	tctatttcaa	4440
tggaaacaga	ataaggaaag	aaatggaagg	gctctggaaa	tttgtcctgg	gctatagata	4500
ctatcaaaaga	tcaccaacaa	taagatctct	cctataaata	taaaaacaag	ataattaatt	4560
ttttaattat	ttttttctct	tcagaggatt	ttatttcaag	ataaaacata	acttctaccc	4620
atactattga	ttccaaagg	tagaaaaagt	gtttttcctc	atcttatcct	tcaaaggagt	4680
cacagcaatg	caaacatcta	taaaatgcct	ctgcataatt	gtcagaagct	atagtccaga	4740
aatcatctgaa	aatgcttttc	catttttaagc	ttaggtgagg	tgtcttagga	aacctctatg	4800
acaacttact	ctattttattg	ggaggtaaac	tcccagactc	tcccagggtc	tcctgtattg	4860
atctcatctt	ttaggtcttc	taatcccttg	aagcacaatc	gaaaaagccc	tggatctctt	4920
ttctgcacat	atcatcgcg	aattcattcg	gcttccagca	agctgacact	ccatgatata	4980
agcggcctcg	cccttctccg	gacgccagtc	cttgctgcgg	ttagctagga	tgagggggtt	5040
gctgggcttc	agtgcaggct	tctgcgggtt	cccaagccgc	accagggtggc	ctcacaggct	5100

63/122

ggatgtcacc	attgcacact	gagtcctg	caggctgtac	caatttttta	attatttta	5160
atatttttt	aaaattatgg	tgaatat	ggatattctgc	tctaaaatag	gccccataat	5220
gcacagcaga	tatctettgg	aaccacagc	tttccactgg	aagaactaag	tatttttctt	5280
ttaaagatgc	tactaagtct	ctgaaaagtc	cagatcctct	acctctttcc	atcccaact	5340
aagacttgg	atattatgaga	gatctagcta	acagaaatcc	cagacacatc	attggttctt	5400
cccagagtgc	agtctctcta	aagaggctca	gccctaagca	ggccccgtgca	ccaggagggg	5460
gggtctgaga	cccacatagc	acttcccaag	gtgcatgctc	cagagaggca	ctgaaacagc	5520
tgagcacaa	cctgcaagcc	tgagaaactc	tcacagtcag	aacggagggg	gcccagtggg	5580
actaacataa	agagaaaagg	gaacacagag	aatggatgg	caccaacaac	cagcaaagcc	5640
ttcatggcca	atgaaaagcat	cagtgcggg	gccagaaccc	tcatcccaa	agactcttca	5700
ctgcctttag	tgaaaaacaa	tggttagaga	gtgaagtatt	gatcatgtat	agagaggtaa	5760
agttacattt	ttatattctg	actctgctaa	tgtgaaattc	cctatctgct	agactaaaag	5820
tttcagacac	cctgttcaaa	tatcccatta	gttgctagag	acttaaatg	aacagaacgc	5880
acattgtcag	gatgactatt	acaaaaaat	caaaagacag	caagtattgg	tgaggatgta	5940
gagaaactgg	aactttttgtg	cactgtttat	gagaatgtaa	aatggagcag	ctgctgtgga	6000
aaagagtatg	caggttctctc	aaagagtaaa	accaagatgt	ggaaacaact	aaatgcccc	6060
cagtgatga	aggggtagac	aatatgtggt	atatacatac	catggagtac	tattcagcct	6120
ctaaaaaaa	aaaaggaaat	tctataacat	gcaacagcat	ggatgaatct	tgaggacatt	6180
ttgctaata	aataaaggcag	tcatagaaa	tcataactg	cacgactcca	cttatatgag	6240
ataccaaaaa	tagacaaatt	catagaatca	aagagtacaa	tgagggttac	ctggagctgc	6300
agggcgga	acgaggagtt	actaatcaac	gaacataacg	ttgcagttaa	gtaagatgaa	6360
taagctctca	agatcagctg	tacaacactg	tacctagagt	caacaataat	gtattgtaca	6420
cttaaaaatt	tgtaagggt	agattaacaa	atgtagtaga	tccacaaatg	tggttaagt	6480
ttcttaccac	agttaaaata	aaaaagaata	tcaagcccag	gagttcgaga	ctagcctggg	6540
aaaagaaaa	aaatagcaaa	cattttaaaa	atacaaaaat	tagccagctg	tgagggtgca	6600
ctcctaggga	ggctgaggtg	ggaggcttgc	ttgagcccag	gaggtcaagg	ctgcagttag	6660
ccatgattgc	accactgtac	tccagcccag	atgacagagc	aagacaccac	ccccccaaa	6720
aaaagaaaa	gaatatacaa	cattttaaaa	gatcagatag	gcaagaacaa	caacaaaaaa	6780
gagatgaaca	gagcatcgac	cctcatctag	tggtattctt	ggtctaactg	aaaaacagac	6840
attgagagac	aaacaatgac	agtgatgtga	tcacagcaat	tacacaggta	tccccgggg	6900
actgcagaag	aaaggaggaa	tgcttaactt	tcagaaaaata	gagaaagcgt	caaacagttg	6960
gtgaaagcct	tccaaaacta	gagagaactg	cacacaccaa	atcacagaaa	gaagaaaagc	7020
cgtgggagat	tctgggaccc	accggctatt	tttgatggct	gaacaccctg	ctgcaggaga	7080
gacaggagct	gtgggagcatg	gtgggagtaa	acctcaaaac	gctttgctg	catttgcttaa	7140
gatgactggg	cttgattaac	tctagtcaat	ggggacaatt	caatcaaaga	agaaagatgc	7200
tcaaattcac	atttttagaat	gattttttat	ggcagtatgg	ggaatagatt	aaaagagagt	7260
gaagctggag	gcaagaaact	tgtaagagg	caactgaaac	agtctagatg	ataaataata	7320
aactgacaga	gtgactagaa	aatcagaac	aggctgaatc	aacagatacc	tagatgaaaa	7380
taacaggact	tgatcaccag	ttgtatcttg	gagaggaagg	agttgtttcc	ttgctttccc	7440
tacgactggg	aatacggaa	gtttgcccgtg	tgtattgggt	atatactgg	gtgtagccaa	7500
tactgacaa	ccatttagca	gcttaaaaca	caaaggctta	tctcccagtt	tctgtgggcc	7560
aggaatctaa	gataggctta	gctggctggt	tctggctcag	agtttctcaa	gaggttgcaa	7620
tcaagatgct	agctgggggt	gcacatctg	aaggctcaac	tggggccgga	gggtccactt	7680
ccaaggagtt	cactcacctg	cctgacaagg	cagtgcctgt	tggtggcagg	agatctcaat	7740
tcatggccaa	gtgagcctct	ctatagcatt	gctggaacat	cctccccatc	tggcagttgg	7800
cttctctcag	catgagtgat	ctgagagaga	gacgaaggag	gaagccacag	tggtcttctt	7860
actcctactc	ctaacactat	ggacctactc	ctaacactct	cacttctgcc	ttattccatt	7920
agttagaaag	ggaactaagc	tccacctctt	gaaataagaa	gtgtcaaaga	atttgtggat	7980
atatttaaaa	atcatcacac	tggtggaagt	gatagggggt	tcaattaatg	ctgaacttga	8040
aatgcctgag	acattcaaat	gtccaacagg	caatgaacat	acccatagat	ggatcatgact	8100
ttagcaagaa	tagaggaaga	tcacagaatt	aaggaggaat	tgaaaggtaa	aagaagtgga	8160
gtcagattcc	ccctgaaaag	tgagccatga	aaggaaactt	aactattgag	ttagaggcca	8220
gagtaggaaa	tttcgggtgga	attctttttt	aaagaaagga	accatataag	catgttttga	8280
ggtagaggga	gaataaatca	gtagacaggg	agaggtaaaa	aacataaatg	ataggggata	8340
gttgacaaa	gtcttgccag	aatcccttac	gattgactt	ggggccaaga	gagggacact	8400
tctttgtttg	agggataagg	aaaataagaa	agaatgggtg	ctatttagtg	tggtcctgtc	8460
tctagggcaa	acgcataaggt	aacaaactgt	gtgtgttagg	aatatagatg	tgacctcaca	8520
ttgagattct	cacctcaaat	cattttgtt	gttacctgta	ccttctacc	ttctctttt	8580
gctacatgca	gactgctgtt	ttgtcttctt	ggcctgttcc	aggtttcagc	attctggcat	8640
atctgctacc	ctgttcccaa	acctctctag	agtccatgct	ccttccctgg	atagtgttgt	8700

64/122

attggggccac	gatatctaaga	agtgatgcct	tcagtttaggc	ctgagaacct	cctctatgga	8760
aatctccatc	agtgaccctg	acagacttgg	tatcttggag	atgtcactgc	tcccagcctg	8820
tggtctagga	gaatctcagc	ctgggcctct	agtagtatgg	ataaggcggt	aaggatatctt	8880
tgaaccagag	tctgtcatat	tcctcaatgt	gggacagata	aaacagtggg	agtgcctggg	8940
tttctgagct	agaactctgg	tttttgggtct	agattctttg	atgtatgacc	tttcagaggt	9000
attaaaaatt	gttctaatac	aatgttcaat	acaaatgtag	ttccttttct	gttaggacct	9060
caacaaaaca	tgaccaactg	tagatgaaca	ttaaaactatg	acaattcatg	gaaatgaata	9120
cagtaatacc	tgcggttccc	ccatttttagc	agtcactatg	gtgacatttg	gcacaaatgg	9180
ctatttaagg	gtgcttttgt	taaaacctac	catcttacta	ggcacatgat	attgaaacta	9240
atgaaataat	ggagaaactt	cttaaaaaact	tttaatgaat	aaagtgatga	agtgaataa	9300
ttttagctgc	tatttataaa	gtgactatta	caggtcaaac	attcttctag	ggtttttttg	9360
ttgaagtgtg	cacatttaat	ccttaataac	ccactatgag	tcaggtattc	ttctctcccc	9420
tttgacagct	tggggaaaatg	ggggtcagag	aggtttaggt	atttgctcag	ggccacacaa	9480
cctgcattga	gaaaatctga	gatttgtaca	ggaacgtatc	aaactctgaa	gtccatgctt	9540
ctattttccc	atgctgcctt	tctaataaaa	ggtaactaat	gctactggat	gctgccccca	9600
aagtgcagtc	ctttcacccc	accctacttg	attttctcca	taaaactaat	cacatcctga	9660
caacttattt	attgctgatc	tccccacta	gattataaac	tcaataaaag	caagatcctt	9720
gtctgctgaa	tatcagtagc	taaaacgctg	tctagcacag	agcaagtaat	taatatttgt	9780
tgaatgaaca	aataaaggaa	aaaaattcaa	aggaagaaaa	agccctaaaa	cagatgttta	9840
cctaaacata	catttttaaaa	gaaagcatat	aacaaattca	ggacagaatt	taaatttgat	9900
tttttaagaa	aataaccaag	tgctagctgg	gcacagtggc	tcacacctgt	aatcctagca	9960
ctctgggagg	ccgaggcagg	cagatcactt	gaggtcaaga	gttcaagacc	agcctggcca	10020
acatggtgaa	acctgtctct	actaaaaata	cagaaattat	ccaggcatgg	tggcaggtcc	10080
ctgtaacccc	agctactcag	gaggctgagt	caggagaatt	gcttgaaccc	aggaggcaga	10140
gggtgcagtg	ggccaagatt	gcaccactgc	actccagcct	gagtaacaaa	gcaagactct	10200
gtctgaagga	gaaggaaaga	aagaaggaaa	gaaggaaaga	aggaagaaag	gaaagaagga	10260
aagaaagaaa	gaaagaaaga	aagaaagaaa	gaaagaaaga	aagaaagaaa	gaaagaaaga	10320
aagaaagaaa	aagaaagaaa	gaaagaaaga	accaaagtgt	tatttgggag	ctactatgct	10380
atgtttttcc	atgcacgcta	ttttcagtaa	agcagtttagc	aaacttgcaa	gatcataaca	10440
acaaatatat	gcttctataa	ctctaaaatt	gtgctttaaag	aagtccctct	ttaccagctc	10500
atgtatgcat	tagttttcta	agagtactta	taagcttttt	ccctggagaa	tatccacagc	10560
cagttttattt	aaccaaagga	ggatgcttac	taacatgaag	ttatcaaagt	tgagcctaag	10620
ttgggcccagt	tcattgttaat	atactccaga	acaaaaacca	tcctactgtc	ctctgacaat	10680
ttacattgaa	aattcatttt	ccacattacc	aggagccag	ggtaggagaa	tatagaaaga	10740
ccacccaaga	atccttactt	ctttcagcaa	aatcaattca	aagtaggtta	ctaaacacat	10800
gccctaacaa	tgaatagcag	attgtgctca	gaagaatgat	ctacaacatc	ttactgtgaa	10860
ggaactactg	aaatattcca	ataagacttc	tctccaaaat	gattttattg	aatttgcat	10920
ttaaaaata	ttttaagcct	aaatttttaa	aggtttgata	ttggtacatg	aatagacaaa	10980
cagacatgga	ctagaccaag	aattaggttc	aaacatatac	aggaatttaa	tatacgataa	11040
atctagtatt	ccaaaggaac	caacaaatgg	tgttcagaca	gcaggatagg	catcaggaaa	11100
aacacagttg	ggcacccctac	cttactccta	acaccaggag	taactgaagg	agcaccacaa	11160
atttatttat	tttaattata	gttttaagtt	ctagggtagc	tgtgcacaa	atgcaggttt	11220
attacatagg	tatacatgtg	ccatgtttgg	gaggagcacc	aaatatttaa	aagaaaaaaa	11280
ttggccaggg	gcggtggctc	acacctgtaa	tcccagcact	ttgggaggcc	aaggtgggca	11340
gatcacctga	ggctgggagt	tcgagaccag	cctgagcaac	atggagaaac	cccatctcta	11400
ctaaaaatc	aaaattagcc	aggcatgggt	gcacatgcct	gtaatcccag	ctacttggga	11460
ggctgaggca	ggagaatagc	tttaatctgg	gaggcacagg	ttgctggtag	ctgagatatt	11520
gcactccagc	ctgggcaaca	agagcaaaaac	ttcaactcaa	aaaaattaat	aaataaataa	11580
aaataaaaga	agaaaagaaa	aaaatgaaaa	tagtataatt	agcagaagaa	aacaccgtag	11640
aatcctcgga	ctcttaggat	ggggaatgcc	tataatataa	aaaccctgaa	gttataaaaag	11700
agaaaatcac	ctacatacaa	accaaattctt	tctacatgcc	taaaacatag	cacaaacaca	11760
gctaataaat	catagctgaa	tgaactggga	aaacaaaact	tgactcatat	ccagacagag	11820
ttaattttcc	tacacataaa	gagtacctat	ataaacccaa	caaaaaaacc	accactaacc	11880
caaaaataaa	atgtgacagg	taatgaacag	gtagttcaca	gagaatacaa	atggctcttc	11940
ggcacataag	atgctcagac	tgacttttac	ttatttattt	tttgagagag	agggctcac	12000
gatgttgccc	agggttaggct	caaactcctg	ggctcaaagt	atagtaccag	gactacaggt	12060
gtgccccacc	gcacctgggt	cctcaaccac	ctgtattaac	aggaattgca	aaataaaact	12120
ttcaaatcta	ttttacctat	tagaatggca	aaaatttgaa	aaacttcaaa	catcatcatg	12180
ttggtgagaa	tgtgaggaga	ctggcactct	cattttttgc	tgatagcata	tatatactga	12240
tggcttctat	ggaaaagcaat	ctggcagcgt	ctatcaaatg	tacaagtgc	tatatccttt	12300

65/122

gacaaagcaa	ttccactcta	ggaatgtggt	ctatatggtt	gtgcttcctg	gggctgggaa	12360
ctgggagcta	agggacaggg	gcagaagata	atcttctttt	ccctccttcc	ccgttaaaca	12420
tggtgaattt	tatatactgt	aatatattat	ttttcacaaa	agataatttt	taagcgatat	12480
gtctgggaat	tttttttttt	cttttctgag	acagggtctc	actctgtcat	ccaggctgga	12540
atgccatggt	atgatctcag	ctgactgcag	cctcgacctc	ctgggttcaa	gcaatcctcc	12600
cacctcagcc	tcctgagtag	ctgggactac	aggcacgtgc	catcatgcta	atttttgtat	12660
atacagggtc	tcactatggt	gcccaggcta	atgtcaaaact	cctaggctca	agcaatccac	12720
ccacctcagg	ctccaaagtg	ctgggattac	aggcgtgagc	caccgcgcct	ggccctggga	12780
attcttacaa	aagaaaaaat	atctactctc	cccttctatt	aaagtcaaaa	cagagaagga	12840
aattcaacct	ataatgaaag	tagagaaggg	cctcaaccct	gagcaacaaa	cacaaaaggct	12900
atctctgaga	caggaatttg	ctgaacaaaa	tcgagggaag	atgacaagaa	tcaagactca	12960
cttctcggct	gggcgagtg	gctcacacct	gtaatcccag	cactttggga	ggccgagggc	13020
gacagatcac	gaggtcagga	gattgagacc	atactggcta	acacagtga	acccagtctc	13080
tactaaaaat	acaaaaaatt	agccgggctg	ggtggcaggt	gcctgtagtc	ccagctactt	13140
gggaagctga	ggcaggagaa	tgccgtgaac	ccaggaagcg	gagcttgca	tgagccgaga	13200
tcacggcact	gcactccagc	ctgggtgaca	gagcaagact	ctgtctcaaa	aaaaaaaata	13260
aagactcatt	tctctagatc	ttgagccgta	ttcaaattta	tctcagctta	gtgagaggtt	13320
aaagcaagga	atatccttcc	ctgtgggccc	tgctccttac	tgaaggaagg	taacggatga	13380
gtcaaggaca	ccaatggaga	aaagcactaa	caccattatc	tgatgaacat	tacgtgaaga	13440
agggtaagaa	gtgaagtggg	attgctgaag	aagtcagtga	aagcggacat	tcatttgggg	13500
aaatggaata	taggaatccc	ataaaaagtga	ttaaaaagat	gttagaggct	gaggcggggg	13560
gaccacaggg	tcaggagatc	gagaccatcc	tggttaacac	ggtagaaacc	catctctact	13620
aaaaatacaa	aaaattagcc	aggcgtgggt	gcaggcacct	gtagtcccaa	ctactcggga	13680
gactgaggca	ggagaatggc	atgaacctgg	gagacggagc	ttgcagttag	ccgagatcac	13740
gccactgcac	tcacgctggg	gtgacagagt	gagactccat	ctcaaaaaaa	aaagttagat	13800
acgagagata	aagatccaac	agacacacaa	ctgctaattc	tgaacagaac	aaaacaaatg	13860
gcacaggaaa	agaaaaat	agataataca	ccggaatact	ttcctgaaat	tgagttaactg	13920
aatctatagc	ttgaaaagggt	ttagcatatg	ccaagaaaaa	tcagttagagt	ccaaccagca	13980
caagacacat	ctagcaaggc	tggtgattct	accaacacag	agaaagaagt	gggtgaccca	14040
taattgcggaa	aaaggcagac	catctgcagt	cttctccaga	acactggagt	ctgaagacaa	14100
aagaatgctg	cctactgagc	cagaaggag	agaaagtga	ccaacacatc	tttaccaggt	14160
tagaatgtca	cgcattat	aaaggctgca	aaagccatga	aagacatgaa	agaacacaag	14220
cattttacaa	atgaaagaac	acaagcattc	tcataactca	gaatccctaa	gaaaaatgta	14280
gtcctaattcc	agcccaactga	aagttaaatg	tacttaattg	gctcattaat	gggaacttca	14340
tagcttcaaa	tcagtctggt	cccatctacc	aacatctctc	gcccggcttt	cctgcaatag	14400
tcagcacctt	tcctcctccc	cagtcttggt	ccctggagtc	tgctctcagc	atagcagagt	14460
gaccacatca	acacccaagt	cagagccctc	tggtctacac	tggtctacaa	agcccttccc	14520
acccccacc	ccacgtgccc	tcgggaccc	tgtagcgtgt	ctcctgcata	ccctagcagc	14580
cctggcctcc	tcactgcccc	tcctgtacat	caggaaggcg	actccttgag	tcctggctct	14640
ggccgctccc	tcactctgca	tgaggttaac	tccttaacct	actctaggtc	attgctcaaa	14700
tgtagcatc	tcaatggggc	cctccctgac	taccctat	aaattctaca	tactcccctt	14760
gaccccatgg	acctcactca	ccctattcca	cttttattct	tacaatttag	cacttggtct	14820
cttctaactg	attctaagac	ttactcattt	attacattgt	ttgccacccc	ctctagtaca	14880
taaactccag	aggggcaggg	atctctgtct	atcttatcat	ttctttatcc	ctaggacata	14940
gaacagggga	tagttcagag	tattcaatgt	tatcaatgaa	tgaactagca	gtagtaccag	15000
ttccagttag	gcacagaatt	aaatctaact	agaattaaat	ctcatggtct	gggttaacta	15060
tggaatagaaa	attagatata	attttaagaa	gcctagaaag	aaaaaattaa	taatgtaaaa	15120
ataatattaa	tttgataata	ataacaaaaa	ctctgccagg	cactgtggct	caaatctgca	15180
atcccagtag	ctcaggaggc	tgaggtggaa	ggatcacttg	agaccagagt	tcaagactca	15240
gcctaggcaa	cacggcaaga	aaactgtctc	aaaaaaatta	aaacttaaat	ttttaaaaaa	15300
gaattctcaa	agcgtcacaa	aaactggaga	ttaaaggtaca	ggaagtgtga	agtaatat	15360
ctatgctaatt	ggtttttttt	tttttttagaa	caattaaacc	aaaagatttc	tttctcaagt	15420
cgataaaactg	agaaagataa	gcatactctc	caattaaacag	agggggagga	aaagccagat	15480
acaacaaaat	aagatataaa	ttagttttcca	ggtgaaaaca	agagtaggag	ttatttttga	15540
tcacctcacc	tgtgacctcc	cccagcccaa	aaaacactac	tgataaacag	ggtagaaaag	15600
catcatctca	gataaagcag	gaaaaactgc	acacagctca	aaccacaaac	tataagcaca	15660
cacctggcca	acctgcca	gtctgggctc	agtaggagga	acgtgctgag	agctaggatg	15720
taccaactta	gacattctgt	gggatacaga	tgctccctgga	agggtcacac	catctcaagt	15780
gcacctgtaa	tgcccactga	ttacagccac	catatgtgag	agagaaactc	agggcactta	15840
gagagtataa	caagaacctt	atgtcatctg	agatagggaa	tcctcagccc	tgcaaatata	15900

66/122

ccaactcttt	agaacaactg	gcaaaacata	aatatccaca	actttttggtt	cagtaattcc	15960
actcttagat	atcaatccaa	agtacatgag	acagcagata	cacacacaaa	atgggtattta	16020
ctgcagcatt	gtttataata	gcaaaaaaca	agaaataatc	catatgtctc	aataggatac	16080
tgggtacatg	agggtatgta	cccatcattc	aaccatcaaa	aagagtata	tggtatgtcca	16140
cagatggaca	taaaaagctg	tgtgttacgt	gaaaacaaac	tcaagcagca	gcaggatggg	16200
cttatgatag	tcagtatgag	ctaatttctg	gaaaaaaaa	tctagtgtgt	gcacagaaaa	16260
catctgaaag	aacagaaaaca	aaactatcag	cagaatattg	agatgtttta	ctaagttgta	16320
tatctatact	gcttgtaatt	tttaccctaa	gcaagaatta	ctttttggaa	aaagaaaatt	16380
caggaaataa	agcatttctt	taaaactcat	gtttaaacaa	atgggtgatgg	aataaaaagag	16440
ttcttattca	tcataaacac	acacagcaca	catgcacgca	tgtgcgtgag	cacacccttt	16500
acttgataaa	taccatgttg	aatattttag	tctttccttt	taggttctat	cccttcactc	16560
aaaatgcggt	tataaataaa	tgtacttttc	atgtgccttc	tgcctaaacc	cactttaata	16620
taactttaca	gtcccattat	cattatagtc	tcaaagctag	actcagcctg	aaactaccct	16680
ttcattttgga	acccttatta	aaatgccaca	tacagctcct	tcaaataaaa	acaaacccta	16740
ggacctgaca	ctaggcttcc	tttgttgcta	ctcataatgg	ccaagttctg	tgcttataat	16800
acatcttctt	ctattttatt	gtctacatata	caagggtttt	atatgttttt	cttattatat	16860
cttaattcaa	aacaccatca	cgctcttttc	cagatgaaaa	taaggaaaaag	aaattgagca	16920
actgactgac	ttaaagggtca	taaaactata	tagtagcaga	gtcagcaaaa	gaagaaacac	16980
acatctccca	agtagaggct	gaaaaccagt	accattcacc	tccagggtga	gctatatata	17040
gattacaaag	tcaccttctc	taaatgttca	aactgaatcc	cataccata	ctttaccact	17100
acctcgtaag	aacagcctca	gatcttgtta	tagccttttt	tttagcatgc	tgaagccaat	17160
aaaatgcttc	ccattcagca	agagaaacaa	gttctgaaac	actgaataat	ctgcccagg	17220
cctatgaaca	tttccactgt	gagaaatgtt	ctccactgtg	tggagaagat	ccttactctt	17280
ctccacacag	gcagaacatt	agaaaaattc	ttggattcta	tgatgcacag	cttaggagtc	17340
tgthttagcac	aattttaagtc	caaatagtta	ttaaatcctc	ctctgttcca	gaaacagtg	17400
taaatactgt	gaatataaaa	attgaaaaga	tactctcctg	gctcccaaga	aagtcagcca	17460
gatagaggag	acacaggcac	acaaatcact	gtcacatgaa	gctctacctc	cctaacttca	17520
aacgagggcc	taagtaccca	agaatacagt	agcagttgtg	actacgagta	actactataa	17580
tcaatactt	tatcttcctc	tagaaaactc	ttctcccttg	gaaatattat	tgcatttcta	17640
aataccattc	cttactaaaa	ggaagcagg	ctccttgagg	aaatagctga	ttctagggtg	17700
ggactatgaa	atgaaaatgg	tgagtctggg	acatcccatg	ttgcccagaa	atcaagggaac	17760
tgcccaaaaga	ttaacagagt	catgttaaat	ggacctaaaga	gtgaaccaga	aggagctcac	17820
tttgccccgc	gtggaacaat	ttcaagaaaa	acatgacagt	aatgaattat	aaaacatgaa	17880
ttaaaataca	tattggtact	aaaaagagaa	caaaaggatg	tggctttgga	taaagctctt	17940
cttcatggaa	gaataccagc	taataaatgt	aaaggaaatg	agagaattag	aaaaattatc	18000
atthttgtaaa	ccttaataata	ttcacctaga	catgctaaaa	ccactgagta	aaaggctgct	18060
tggaagagg	atgctcacat	gatctcagag	tttccacacca	cagataaatt	attagataca	18120
ggaaggaaaga	tgtgatcaag	cttctgtgta	ccccagcca	ggccccacaa	cactatgtgc	18180
ctccttgtga	tgtgggagct	acacagcatc	gccccacacag	cttctcgcca	aaactgtttg	18240
aagctaataca	caagggaaga	actggacagc	ttctgaccat	gagacgctcc	accagacaac	18300
ttgcttgggc	tctccaaaga	aaacttgctg	gcctctccaa	agaaaactca	gtttcattta	18360
aaaacaaaac	taattattta	aaaacaaaacg	aaaagcaagt	tgtggacttg	agctccagg	18420
acagagcaga	catacttttc	cctgttcttc	ccagtaagt	gtaataaaaa	ccctcaacac	18480
tagatataaa	acaaatataa	gaagggtctg	gaaggggaag	aggaggcaga	ctatccagg	18540
gccttgaggc	ccacagaaca	accagtgat	gggttctact	gggtctcttt	ttgcttcatt	18600
atctcagact	tggagctgaa	gcagcaggca	acttcaaaaac	accaaggggc	acagattgaa	18660
aagccccaag	aaaagcctgc	cctctctagc	caaaggacca	ggaaggagac	agtctaataga	18720
gatggaacac	atthtagacag	taactgcccc	tttaccagca	ataactgagc	agggagccta	18780
gacttccagt	cttgtgagga	cgtaccaagg	taccaaacac	ccccaccaag	gctgagtaag	18840
gactgcgact	tttatccctg	catggcagta	gtaaggagcc	catccctcac	ccgccagcag	18900
tgctcaggga	acctggactt	ccactcccac	ccaggagtga	tgaggccctc	cctgctgggg	18960
tcactgtcaga	ggaggcctag	tggagattca	gtgacttaac	cttttcccag	agataatgag	19020
gccacctttc	ctccctcttc	ccccatggtg	acagtgaag	cactgtggca	agcagtaggc	19080
actcctaccc	ctcctagcca	gggaggtatc	agggaggcca	agtaggggaa	cagaataccc	19140
acaaccaccc	agcagcaaca	ggggtcccc	acccattgg	gtgtcaatgg	aagcagagcg	19200
gaaagcctgg	atatttacc	ccatctagaa	gtaacaagct	gatgtcccc	ttcttctact	19260
acaatggtgt	tcaaaacagg	tttaataaag	gtctagagtc	tgataacgta	atacccaaat	19320
cgthgaagtt	ttcattgagg	atcatttata	ccaagagtca	ggaagatccc	aaactgaaag	19380
agagaaaaga	caattgacag	acactagcac	taagagagca	cagatattag	aactacctga	19440
aaggatgtta	aagcacatat	cataagcctc	aacaggctgg	gcgcgggtgg	tcacgcctgt	19500

67/122

aaccccgca	ctttgggagg	ccgaggcagg	tggatcacaa	gatcaggaga	tcgagaccat	19560
cctggctaac	acgggtgaaac	cccgtctcta	ctaaaaatac	aaaaaaaaat	agcaaggcat	19620
ggtggtgggc	acctgtagtc	ccagctactc	gggagcctga	ggcaggagaa	tggcatgaac	19680
ctgggaagag	gagcagtgag	ccgagatcgc	accaccgcac	tccagcctgg	gcaacagagc	19740
aagacttcgt	ccccaaaaaa	aaaaaaaaaa	aaaaaaaaagc	ctcaacaaac	aactacaaac	19800
gtgcttgaaa	caaatgaaaa	aaaaatcttg	gcaaagaaat	aaaagatata	tattttggcc	19860
agggtcagtg	gctcacagcc	tgtaatccct	gcactttggg	aggctgaggc	aggcggatca	19920
cctgaggtca	ggagtttgag	accagcctga	ccaacatgga	gaaaccccgt	ctctactaaa	19980
aatacaaaat	tagccagtca	tgggtggcaca	tgctgtaat	cctagctact	caggaggccg	20040
aggcaggaga	atcgcttgaa	ctcaggaggt	ggaggttgcg	gtgagccgag	atcccgccat	20100
tgcacattgc	actccagcct	gggcaacaag	agcaaaactc	catctcaaaa	aaatagatac	20160
atattttaat	ggaaatttta	gaattgaaaa	atacagtaac	caaattgaat	ggaaagacaa	20220
atagaaatgg	agggggcaga	caaaaataatc	agtgaacttc	aacagaaaaat	aatagaaatt	20280
acccaatatg	agaaacagaa	agaaaaataga	ctggccaaaa	aataaagaag	aaaaaagagg	20340
agcagcagga	ggaatgatgg	aaaaagagaa	aggaagggaag	gaagggaagg	aggggaggga	20400
ggagtgcagg	agaaagctct	aaagacacct	gagactaaaa	taaaagatct	aacacttgct	20460
atcagggctc	aggaaagaga	caaagatggc	acagctggaa	acgtattcaa	aaaataatag	20520
ctgaaaactt	cccaaatttg	gcaagagaca	taaacctata	gatttcgaaat	gctgaacccc	20580
aaataaaaaag	cccaataaaa	tccacaccaa	aatacatcat	agtcaaaact	ctgaaaagac	20640
gaaaagagaa	aacgtcttga	aagcagtgag	tgaacaaca	cttcatgtat	aagggaaaaa	20700
caattcaagt	aacagatttc	ttacagaaat	taagggaagcc	agaaggaaat	gacacaatgg	20760
ttttcaagtg	ctgaaagaaa	agaagtgtca	acacaaaatt	ctagattcag	taaaaatatc	20820
cttcaagaat	caatgggaaa	tcaagacagt	ctcagataaa	gcaaaaataag	agaatatgtt	20880
gccagcagat	ctcccctaaa	ggaatggcaa	aaggaagatc	atgcaacaga	ccaaaaaatg	20940
atgaaagaag	gaatccagaa	acatcaagaa	gaaagaaata	acatagtaag	caaaaaatac	21000
tgtaatatac	ataaaatttc	tatctcctct	taagacttct	aaattatatt	gatggttgaa	21060
gcaaaaatta	taacctgttc	tgaagtgtct	ctactaaatg	tatgcagaga	attataaatg	21120
gggaaagtat	aggtttctat	acctcattga	agtggtaaaa	tgacaacact	gtgaaaagtt	21180
acatacacac	acacacgtaa	gtatatataa	atatatgtgt	gtatatgtgt	gtgtatatat	21240
atataacat	ataatgtaat	acagcaacca	ctaacaacac	tatacaaaag	gataataacc	21300
aaaaacaatt	tagataaatt	gaaatggaat	tctaaaaaat	attcaaatat	tctacaggaa	21360
gacaagacaa	aaagagaaaa	aaagaggagg	acaaactaaa	ttttttaaaa	acataaataa	21420
aatggtagac	ttaagcccta	acttatcaat	aattacataa	atgtaaatga	tctaattata	21480
tcaatttaaaa	gcagagata	gcagagttaa	tttaaaaaaca	tagctataag	aaacctgctt	21540
tgggctgagt	gcagtgactc	acacttgtaa	tcccagcact	tccggaggcc	aaggcgggtg	21600
gatcacctga	ggtcaggagt	tccagaccag	cctggacaac	atggtaatac	cccattctcta	21660
ctaaaaaatc	aaaaaaatta	gccaggcatg	gtggcacacg	cctgtagtcc	caactactca	21720
ggaggtcgcg	acacaagaac	tgcttgaacc	cgggcagcag	aggtagcagt	gggccaagat	21780
tgcgccactc	cagcctgaac	gacagagtga	gactccacct	cagttgaaaa	acaaaaaaga	21840
aacctgtctt	aaatatacca	acatatgttg	gttgaattta	aaagaataaa	atatatcatg	21900
aaaaacattaa	tcaaaagaaa	ggagtggcta	tattaataac	ataaaataga	cttcagagaa	21960
aagaaaattt	caagagacag	gaataaaaag	atcaagaaaa	gatcctgaaa	gaaaagcagg	22020
caaatcaatc	attctgtctt	gagattcaac	acctctctt	aacaactgat	agaacaacta	22080
gacaaaaaaa	tcagcatgga	gttgagaaga	acttaacacc	actgaacaac	aggatctaata	22140
agacattttac	ggaacactct	acccaacaat	agcaaaaata	acattctttt	caagtattca	22200
ctgaacatat	ccttagaccc	tacctgggc	cataaaaaca	agctcactag	tgattgccga	22260
aggcttggtg	ggacagtgga	agagctgcat	ggggaggagg	aaggtagacag	ttaaagagtg	22320
taggattttct	ttttgggata	atgaaaaatg	tccaaaattg	attgtgggtga	tgttggcgca	22380
actctacaaa	tataaaaaag	gccattgaat	tgtacgtttt	aagtgggtga	aacatatggt	22440
atgtggatta	tatctaacgc	tttttaaaaa	cttaacacat	ttcaaagaat	agaagtcata	22500
cagagtgtgc	tctactggaa	tcaaactaga	aagaggtaac	tggaggataa	cgagaaaagc	22560
ctccaaatac	ttgaaaactg	gacagcacat	ttctaaaaat	atccgtgggt	caaagatatt	22620
catttctgat	attcattttt	attgtttaat	gtatttttaa	aaatttctta	agggaaataa	22680
actgactaaa	aatgaatatg	gctgggtgcg	gtggctcag	cctgtgatcc	cagcactttg	22740
ggaggccgag	cttgggtgat	cacaagatca	ggagttcgag	accagcctgg	ccaagatggt	22800
gaaaccccgt	ctcaactaaa	aaactacaaa	aagtagccaa	gcgcagtggc	gggagcctgt	22860
ggtcccagct	acttggggag	ctgaggtagg	agaattcgct	gaacacaggg	agcagaggtt	22920
gcagtgcgcc	aagattgtgc	cactgcacgc	cagcctgggc	gacagagact	gcctcaaaaa	22980
aaaaaaaaaa	aaaaagaata	tcaaaatttg	tgggacatag	ttaaagcaat	gctgagaggg	23040
aaattttataa	cactaaatgt	ttacattaga	aaagagaaaa	agtttcaaat	caatagttct	23100

68/122

cactcccc	tcaagaacac	agaagatgaa	gagcaaaa	aaacccaaagc	aagcaaaaaga	23160
aagaaaaat	aaaaataaat	cagtaaaatt	gaaaacagaa	acacaataaa	gaaaaatcagt	23220
gaaacaaagt	actgattctt	cgaaagatta	ataaaaattga	caaacctcta	gcaaggctaa	23280
caaacaaaa	agaaagaaga	cacggattac	cagttattag	aatgaaagca	taattagaaa	23340
caactctaca	cattataaat	ttgacaatgt	agatgaaatg	gactaattac	tgaaaaaaca	23400
caaattacca	caactcaccc	aatatgaaat	agataattgg	gatagcctga	taactactga	23460
gaaaaattgaa	tttgttaatt	taacactctt	aaaacagaaa	cattaaactt	aatattttat	23520
aaatattaga	taaggttaatt	atacccttcc	ttaacaaata	aaaacgacaa	attattttgc	23580
agctaaagag	atgtatgtac	tgtgaaaaat	atcttcagaa	aaatagaact	ttgtttgaag	23640
aataaggatt	taaaaaatgt	ttttaactct	caagaagcaa	atatctgggc	ccagatgggt	23700
tcaactgaaga	attctacca	atgtttaatg	aagaattacc	accaactcta	catagcatct	23760
ttgagaaaa	tgaagagaag	ggacatctc	ccagttcatt	ttatgaagt	ggtgttactc	23820
tgatactaga	actgtataag	gacagctact	cttgacacac	tgccctatggg	tagctctgct	23880
ctgcaggaa	agtcagaaaa	aaaaaaaaaa	gaagcactgg	acaagggcag	tataaaaaaa	23940
gaaaactggg	ccaggtgcag	tggctcacac	ctgtaatctc	agcactttgg	gaggctgacg	24000
cttggtggatc	actgtaggtc	aggagtttga	gactagcctg	gcccaactgg	taaaacctcg	24060
tctctactaa	aatacaaaaa	ttagccaggc	aggggtgggtg	ggaaaaataa	aaggaaaaaa	24120
aaacaaaaat	aaactgcaga	ccaatatcct	tcattagtag	agacacaaaa	ctccttaaac	24180
tccttaacaa	aatattagca	agtagaagca	atatataaaa	ataattatac	accatgatca	24240
agtgaggactt	attccagaaa	cgcaagtctg	gttcaacatt	tgaaaaaca	gtaacccact	24300
atatgaacgt	actaaagagg	aaaactacat	aatcacatca	atcaatgcag	aaaaaagcat	24360
ttgccaaaa	ccaatatcca	ttcatgatac	tctaataaga	aaaataagaa	taaaggggaa	24420
attccttgac	ttgataaagc	ttacaaaaa	ctacaaaagc	ttacagctaa	cctatactta	24480
atgggtgaaa	actaaatgct	ttcccctacg	atcaggaaca	aagcaaggat	gttcactctc	24540
attgctctta	tttaacatag	ccctgaagtt	ctaacttgtg	caaaacgata	agaaagggaa	24600
atgaaagacc	tgcaagattg	caaagaagaa	ataaaactgt	tcctgtttgc	agatgacatg	24660
attgtctcat	agaaaatgta	aagcaactag	gggttagggg	gcagtgagg	cacgctgggt	24720
aaaggataacc	aaatctcagt	taggaggagt	aagttcaaga	tacctattgc	acaacatggt	24780
aactatactt	aatatattgt	attcctgaaa	atactaaaag	agtgggtgtt	aagcgttctc	24840
acccacaaaa	tgataactat	gtgaagtaat	gcatacgtta	attagcacaa	cgtatattac	24900
tcacaaaacat	catgtgtgtac	atgataaata	cacacaattt	tatctgtcag	tttaaaaaa	24960
catgattttg	gccaggcaca	gtggctcata	cctgtaatcc	cagcatttta	ggaggctgag	25020
gcgagcagaa	aacttgaggt	cgggagtttg	agaccagaat	ggtcaacata	gtgaaatccc	25080
gtctccacta	ataatacaaa	aattagcagg	atgtggtggc	gtgcacctgt	agacccagct	25140
acttggggagg	ctgagggcacg	agaattgctt	gaacaaggga	ggcagagggt	gcagtgcagct	25200
gggtgcccact	gcatttccagc	ctgggtgacag	agtgagactc	catctcaaaa	aaaaataaat	25260
aaagcatgac	ttttcttaaa	tgcaaaagcag	ccaagcgcag	tggctcatgc	ctgtaatccc	25320
accactttgg	gaggccgagg	caggcagatc	acaaggtcag	gagtttgaga	ccagcctgac	25380
caacatgggtg	aaaccccatc	tctactaaaa	aatatataaa	ttagccaggc	atgtgtagtc	25440
tcagctactc	aggaggctga	ggcaggagaa	tcacttgaac	ccggaggcag	agggttgcagt	25500
gttgagccac	cgcaactccag	cctgggtgag	agaacgagac	tccgtctcaa	aaaaaaaaag	25560
caaaaataacc	taatttttaa	aacactaaaa	ctactaagtg	aattcagtaa	gtcttttagga	25620
ttcaggatat	atgatgaaca	tacaaaaatc	aattgagctg	gacaaaggag	gattgtttta	25680
ggtcagtagt	ttgaggctgt	aatgcacaat	gattgtgcct	gtgaatagct	gctgtgctcc	25740
agcctgagca	gcataatgag	accacatctc	tatttataaa	aaaaaaaaatt	gtatctctat	25800
gtactagcaa	taagcacatg	ggtaactaaa	ttaaaaaacat	aataaatact	gttttttaatt	25860
gcctgaaaaa	aatgaaatac	ttacatataa	atctaacaaa	atgtgcagga	cttgtgtgct	25920
gaaaactaca	aaacgctgat	aaaagaaatc	aaagaagact	taaatagcgt	gaaatatacc	25980
atgctttatag	gttggaaaac	ttaatatagt	aaagatgcca	attttatcca	aattattaca	26040
caggataaca	ttattactac	caaaatccca	gaaaaatttt	acatagatat	agacaagatc	26100
atacaaaaat	gtatacgga	atatgcaaa	gaactagagt	agctaaaaa	aatttgaaaa	26160
agaaaaataa	agtgggaaga	atcagtctat	ccagtttcaa	gacttacata	gctacagtaa	26220
tcaagactgt	gatattgaca	gagggacagc	tatagatcaa	tgcaaccaa	tagagaacta	26280
agaaagaagc	acacacaaat	atgcccacaa	gatttctgac	aaaggtgtta	aaacacttca	26340
acgggggaag	atatgtctct	cattaaaggg	tgtagagtca	ttgcacatct	ataggcaaaa	26400
agatgaacct	gaacctcaca	ccctacagaa	aaatctaact	aaaatgactc	aaggactaaa	26460
cataagatat	acattatata	aacattttaga	aaaaggccac	gcacggtggc	tcacgctcgt	26520
aatcccgaca	ctttgggagg	ccaaggcagg	tggtcacact	aaggtcagga	gtttgagacc	26580
agccggatca	acatggagaa	gccccatctc	tactaaaaat	acaaaattag	ctggacgtgg	26640
tggcacatgc	ctgtaatccc	agctacttgg	gaggctgagg	catgagaatc	gcttgaaccc	26700

69/122

ggggggcaga	ggttgcggtg	agccaagatc	acaccattgc	actccagcct	gggcaacaag	26760
agcaaaactc	caactcaaaa	aaaaaaaaaa	aaaggaaaaa	tagaaaatct	ttgggatgta	26820
aggcgaggta	aagaattctt	acacttgatg	ccaaactaag	atctataagg	ccagtcgtgg	26880
tggtcatg	ctgtaattcc	agcactttgg	tcaactagat	gaaaggtata	tgggaattca	26940
ctgtattatt	ctttcaactt	ttctgtaggt	ttgacatttt	tttagtaaaa	aattggggga	27000
aagacctgac	gcagtggttc	acacctgtaa	tcccagcact	ttgggaggcc	ggggcagggtg	27060
gatcacacgg	tcaggagttc	gagaccagcc	tggccaacat	ggtgaaaccc	cgtctctacc	27120
aaaaatataa	aaaattagcc	gggtgtcatg	gtgcatgcct	gtaatcccag	ctactgagga	27180
ggctgaggca	ggagaatcac	ttgaacctgg	gaggtggaag	ttgcagttag	ccgagattgt	27240
gccactgcac	tccagccttg	ggtgacagag	cgagactccg	tctcaaaaaga	aaaaaaaaaa	27300
aaagaatata	aaacgcttac	tttagaaact	atttaaagga	gccagaattt	aattgtatta	27360
gtatttagag	caatttttat	gtccatggc	attgttaaat	agagcaacca	gctaacaatt	27420
agtggagttc	aacagctggt	aaatttgcta	actgtttagg	aagagagccc	tatcaatata	27480
actgtcattt	gaggctgaca	ataagcacac	ccaaagctgt	acctccttga	ggagcaacat	27540
aaggggttta	acccgtgttag	gggtgtaattg	gtttggatat	ggtttgtttg	gccccaccga	27600
gtctcatggt	caaatttggt	cccagtgact	ggaggtgggg	ccttatttga	aggtgtctga	27660
gtcatggggg	tggcatatcc	ctctgaatg	gtttggtgcc	attcttgtag	gaatgagtga	27720
gttcttactc	ttagttccca	caacaactgg	ttattaaaaa	cagcctggca	ctttccccc	27780
tctctcgctt	ctctctcac	catgtgatct	cactgggtcc	ccttcccttt	atgcaatgag	27840
tggaagcagc	ctgaagccct	cgccagaagc	agatagtgat	gccatgcttc	ttgtacagcc	27900
tacaaaacca	tgagcccaat	aaaccttttt	tctttataaaa	ttatccagcc	tcaggttattc	27960
ctttatagta	aacagctggt	accaaagacag	ggggaaatca	acttcattaa	aataatctat	28020
gcagtcacta	aacaaataag	aaacaagaggc	tccagaagtg	ggaagccaat	acccagagtt	28080
cctacaatac	agtatctgaa	aagtccagtt	tccaacccaaa	aaatatatat	atacaggccg	28140
gacatggtag	cttatgtctg	taatcccagc	actttgggat	gctgaggcgg	gcagatcacc	28200
ctaggtcagg	agttcgagac	cagcctggcc	aatatggcaa	aaccccgctc	ctactaaaaa	28260
tacaaaaatt	agccaggcat	gggtggtggat	gcctgtaatc	ccagctactc	gggaggttga	28320
ggcagggaat	cacttgaacc	caggaggcag	aggttgtagt	gagccgagat	cacgcoactg	28380
aactccagcc	tgggcaacaa	agtgaagctc	cacctcaaaa	aaaaaaaaaa	tatacatata	28440
tatatgtgtg	tgtgtgtgtg	tgcgcgcgtg	tgtgtatata	cacatacaca	tatacatata	28500
tatacagaca	cacatatata	tatgaagcat	gaaaagaaac	aaggaagtat	gaaccatact	28560
ttctgtggtt	atgataggat	ggggtatcac	gggggaagta	gacaaggga	actgcaagtg	28620
agagcaaaac	gttatcagat	ttaacagaaa	aagactttgg	agtaaccatt	ataaatatgt	28680
ccacagaatt	aaagaaaagc	gtgattaaaa	aaggaaagga	aagtatcata	acaatattac	28740
tccaaataga	gaatatcaat	aaaggcatag	aaattataaa	atataatata	atggaaattc	28800
cgaggtgaa	aggtagaata	actaaaattt	aaaattcact	agagaagggt	caacactata	28860
tttgaactgg	cagaagaaaa	atttagtgag	acaaatatac	ttcaatagac	attattcaaa	28920
tgaaaaataa	aaagaaaaaa	gaatgaagaa	aaataaacag	aatctcagca	aaatgtggca	28980
caccattaat	caatataaca	tatgcatact	gagagtaccg	gaagcagatg	agaaaagagga	29040
agaaaaataa	ttcaaatgat	ggccagtaac	ttcctagatt	tttgttttaa	agcaataaac	29100
tatacaatca	agaaactcaa	tgaattccaa	gtaggataaa	tacaaaaaga	accacaaaca	29160
gatacaccat	ggtaaaaatg	ctgtaagtca	aaaacagaga	aaatattgaa	agcagctaga	29220
ggaaaaactta	taagagaacc	tcacttacaa	agaacatca	cttataaaaag	aaccacaata	29280
atagaaacag	ttgacctctc	atcagaaaca	atgaatgata	acatatttga	agtgcctcaa	29340
gaaaaaaaat	aaagattcct	atatacgaca	aagctgtctt	tcaaaaaat	acatccaaaa	29400
ggattgaaac	cagggtcttg	tgtacatcca	tgtagatcca	tggtcatagc	agcattattc	29460
acaatagcca	aaaggtagaa	gcaacccaag	gggtccatcga	caaataaata	aaatgtggta	29520
tatgtatata	caatggaatt	tattcagtat	taaaaaggaa	tgaaattctg	acacatgcta	29580
caacatggct	aaacctttgag	aacactatgc	taagtgaat	aagccagcca	caaaaggaca	29640
aataccatat	tacttcactt	gtatgaaata	cctagggttag	tcaaattcag	agatagaaag	29700
taaaaacagt	gttgccaagg	gctgagggag	ggagtaacgt	ggagtatttg	ttgaatgggt	29760
acagaatttc	agttttgcaa	gataaaaaaga	gttctggaga	cagatgggtg	tgaggggtgg	29820
acaacaatac	aaatatactt	tatactactg	aacagtatac	ttaaaaatga	ttaacatggt	29880
gaaaccccg	ctctactaaa	aatacaaaaa	aattagctgg	gtgtggtggc	gggcacctgt	29940
aatccagct	acttgggagg	ctgaggcagc	agaattgctt	gaaaccagaa	ggcggagggt	30000
gcagtgagct	gagattgctc	caccgcactc	tagcctgggc	aataagagca	aaactccgtc	30060
tcaaaaaata	aaaaataaaa	aaaattttaa	aatgattaa	caggaggcca	ggcaggggtg	30120
ctcacacta	taatgccagc	actttgggag	gccgagccag	gcgatcactt	gagaccagga	30180
gtttgagacc	agcctggcca	acatggcaaa	accctgtctc	tgctaaaaat	acaaaaatta	30240
gccaggcatg	gtggcatata	cttataatcc	cagctactgg	tgagactgag	acacgagaat	30300

70/122

tgcttgaacc	caggaggcag	agattgcagt	gagtcgagat	cgcgccactg	aattccagcc	30360
tgggcgacag	agcaagattc	tgtctcgaaa	aaacaaaaac	aaaaacaaaa	agcaaaacca	30420
aaaaataatt	aagcaggaaa	cgagattgct	gctgaggagg	agaaagatgt	gcaggacca	30480
ggctcatgag	agcacaaaa	ttttcaaaaa	atgtttaatg	attaaaatgg	taaattttat	30540
atgtatctta	ccacaaaaaa	aagggctggg	gggcaggaaa	tgaagggtgaa	ataaagacat	30600
cccagagaaa	caaaagtaga	gaatttgttg	ccttagaaga	aacaccacag	gaagttcttc	30660
aggctgaaaa	caagtgaccc	cagagggtaa	tctgaattct	cacagaaaa	tgaagcatag	30720
cagtaagggt	tattctgtaa	ctatgacact	aacaatgcat	attttttcct	ttcttctctg	30780
aaatgattta	aaaagcaatt	gcataaaaata	ttatatataa	agcctattgt	tgaacctata	30840
acatatatag	aaatatactt	gtaatatatt	tgcaataaac	tgacacaaa	agagttggaa	30900
caaagctggt	actaggctaa	agaaattact	acagatagta	aagtaataata	acagggaact	30960
taaaaaataa	atttttaaaa	atttaaaaat	aataattaca	acaataatat	ggttgggttt	31020
gtaattattaa	tagacataat	acaaaaatac	cacaaaaagg	gaagaagaca	atagaactac	31080
ataggaataa	catttttggt	tctaactaga	attaaattat	aaatatgaag	tatattctgg	31140
taagttaaga	cacacatggt	aaaccctaga	tactaaaaag	taactcacat	aaatacagta	31200
aaaaataaaa	taaaataaatt	aaaatgtttg	tattagtttc	ctcagggtac	agtaacaaac	31260
taccacaaat	tgagtggcct	aacacaaact	aaatgtattt	tctcccagtt	ctggaggcta	31320
aacacctgca	atcaagggtga	gtacagggcc	atgctccctg	tgaaggctct	aggaaagaat	31380
cctcccttgg	ctcttccagc	ttccagtggt	tctcagtaac	cctaagtgct	ccttggcttg	31440
tagctatatc	attcctagca	accagaaaaga	agaaaataat	aaagattatg	gcaaaaaata	31500
atgaaatcaa	aaggagaaaa	atggaaaaaa	ataaataaaa	ccaaaagcta	gttctttgaa	31560
aagatcaacc	aagttaacaa	accttttaac	tagactgaca	aaaaggagg	aagactcaa	31620
ttactagaat	cagaaataaa	agaggggaca	ttactaatga	gggattagaa	aagaatacta	31680
cgaacaaatg	tgtgccaaca	aattagaaaa	cttagatgaa	atggacaggt	tcctaggaca	31740
acatcaacta	ccaaaattta	ctcaagaaga	aagagacaat	ttgaatgagc	tataacaaag	31800
gaagagactg	aattgacaac	caagaaacta	tccacaaaga	aaatcccagg	cccagaagat	31860
ttcactgtga	aattcttttca	aacttataaa	tataaattaa	catcagttct	tcacaaactc	31920
ctccaaaaaa	aagAACagat	ctctatttac	agggcgtacg	atcttttagaa	aatcctaagg	31980
gaactactaa	gacactatga	taactgataa	acaagtccag	caaggctgca	ggatagaaaa	32040
ccaatataca	aaaactctatt	atatttctat	acacttgca	tgaacaaccc	aaaaatgaga	32100
ttaagaaaat	aattcaattt	acaataacat	caaaaagaat	aaaaacactc	aaaaataaat	32160
ttattcaagt	aagtgcacaaa	cttatactct	agaagctaca	aaacactggt	aaaagaaatt	32220
aaaggtttac	ataaatgaaa	aactatccca	tgttcatgga	tcaaaagact	tattactggc	32280
aatgtctctc	aaattgatct	ataaattcaa	caaaatcctt	atcaaaatcc	cagatgaggc	32340
tgggggtggc	ggttcatgcc	tgtaatccca	gcactttggg	aggctgaggc	acgcagatta	32400
cctgaggtcg	ggagctcgag	atcagcctga	ccaacatgga	gaaacccctat	ctcttctaaa	32460
aatacaaaa	tagtcaggcg	tggtggcaca	tgccataaat	cccagctact	cgggaagctg	32520
aggcaggaga	atcgcttgaa	cccaggaggc	agaggttgca	gtgagccaag	atcggtgccat	32580
tgcactccag	cctggggcaac	aagagcaaaa	ttccatctca	aaaaaaaaaa	aaaaaaaaatc	32640
ccagatgact	tcactgttga	aattgaaaag	attattctaa	aattcacatg	gaattgcaag	32700
accttgagaa	tagccaaaac	aaacttgaaa	aacacgaaca	aaatatagga	tgactcactt	32760
gccaattgca	aatgtttacga	cacagcaaca	gtaatcaaga	ctgtgtggta	ctggcaaaag	32820
acacatacat	acatacatat	caatggaata	taattgagag	tacagaaaca	agcctaaca	32880
tctatggtaa	gtgcttttct	attttttctt	ttttttttt	cttttttgta	gagatagaat	32940
ctcaccatgt	tgcccaggct	ggtcttcaac	ttctgggctc	aagcaatcct	cccactgtgg	33000
cctcccaaa	tgctgggata	actggcatga	gccaccacat	ccagcccaga	tgattttcaa	33060
aaaagtcaac	aagaccattc	ttttcaacaa	ataggtctgg	gatgatcaga	tagtcacatg	33120
aaaaaaaaaa	tgaagttgga	ccctccatca	cactaaagtg	ctgcgattat	aggcatcagc	33180
caccacatcc	agcccaaatg	attttcaaaa	aggtcaacaa	gaccattctt	ttcaacaaat	33240
aggctctggga	taatcagata	gtcacatgaa	aaaaaaaatg	aagttggacc	ctccatcaca	33300
ccatattgcaa	aaatttaattc	aaaaatgaat	tgatgactta	aacgtaagag	ttacgactgt	33360
aaaactctta	gaaggaaaca	tacgggtaaa	ctttaaagac	gttaggtttg	acaaagaatt	33420
cttagacatg	acaccaaag	catgaccaac	taaggtaaaa	tagggtaaat	tgtacctacc	33480
aaaaatgaaaa	acctttgtgc	tggaaaggac	accatcaaga	aatggaaagc	caaaaatagcc	33540
aaggcaaat	taagcaaaaa	gaacaaagct	ggaggcatca	tactacctga	cttcaaaagca	33600
acagtaacca	aaacagcatg	gtactagtag	aaaaacagac	acatagacca	atggaacaga	33660
ataaagaacc	caaaaaataaa	tccacatatt	tatagtcaac	tgatttttga	caatgacacc	33720
ccttcaataa	atgatactag	gaaaactgga	tatcgatatg	cagaagaata	aaactagacc	33780
cctatctctc	accatataga	aaaatcaact	cagactgaat	taaagacttg	aatgtaagac	33840
ccaaaactat	aaaactactg	gtagaaaaca	taaggaaaaa	cgcttcagga	catgggtcca	33900

71/122

ggcaagatc	ttatggctaa	aacctcaaaa	acacaggcaa	caaaaacaaa	aatggaaaaa	33960
tagcacttta	ttaaactaaa	aagctcctgc	acagcaaagg	aaacaacaga	atgaaaagac	34020
aacctgtaga	atgggagaaa	atatttgcaa	actatccatc	catcaaggga	ctagtatcca	34080
gaacacacaa	gtgactaaaa	caactcaaca	gcaaaaaagc	aaataatctg	gtttttatat	34140
gggcaaaaaga	tctgaataaaa	cattctcaaaa	ggaagacata	caaatgtcac	tatcattctg	34200
ccagtaccac	actgtccttga	ttacttggtta	gtgtataaat	ttttaaattg	ggaagtgtga	34260
gtcatcctac	actttgttct	tgtttttcaa	gtttgttttg	gctattctgg	gagccttgca	34320
agtataaaat	agccaacaag	tatgaaaaaa	tgctcaccat	cactaatcat	cagagaaaata	34380
aaaatcaaga	ccactatgag	atatcctctc	actccagtta	gaatggctac	tatcaaaaag	34440
acaaaatata	atgggatgctg	gcaaagattt	ggagaaaagg	gaactcctat	acactgtggg	34500
tagggatgca	aatttggtaat	ggccattatg	gaaaaataata	ctgaggtttt	tcaaaaaact	34560
gaaaatagaa	ctaccatag	atccagcaac	cctactactg	ggtattttatc	caaaggaaaag	34620
aagtcagtat	actgaagaaa	tatatgcact	ctcatgttaa	ttgcaacact	gttcacaaca	34680
gccaagacag	ggaataaatc	taaattgtgca	tcaacagatg	aatggataaa	gaaaatgtgg	34740
catatacac	caatagaata	ctattcagcc	attaaagaag	aatgaaatcc	tgtcatccca	34800
gcaacatgga	tgaacctgga	ggacattata	tttaatgaaa	taagttaaagc	acaaaaagat	34860
aaacagtaca	tgttctcact	cagacatggg	tgctaaaaag	aaaaatgggg	cacagaatta	34920
gaaggggagg	cttgggaaaa	gttaattggat	aaaaatttac	agctatgtaa	gaagaataag	34980
ttttagtgtt	ctatagaact	gtaggcgag	tatagttacc	aataacttat	tgtacatgtt	35040
caaaaagcta	gaagagattt	tggatgttcc	cagcacaaag	gaatgataaa	tgtttgtgat	35100
gatggatatac	ctaattaccc	tgattcaatc	attacacatt	gcatacatgt	atcaaattat	35160
cactctgtat	ctcataaata	tgtataatta	ttacgtcaac	aaaaaaagga	aaaaaaagaa	35220
aattaaagaca	accacataaa	tgggaagaaat	aaaatatctg	caaattatat	atatctgata	35280
aatattttaat	atttataata	tataaagaac	tctacaact	caagaacaa	aacaaaacaa	35340
ccaatttcaa	aaatgggtaa	aagccttgaa	tatacactta	tctaaagact	atatacaatt	35400
ggccaataaa	gacacgaaaa	gatgctcaac	atcactagtc	atcagggaaa	tataaatcaa	35460
aaccacaatg	tagaatgtag	acaccacttc	atatgcacta	ggatggctag	aataaaaagg	35520
taataacaaa	tgttggtaag	gatgtgaaaa	aatcagaaac	ctcattcgct	gctgttggga	35580
atgtaaaagt	atgcagccac	tttggaaaaac	agtctggcag	ctcctcaaat	tattaaatac	35640
agagttaccg	tatgaccag	gaatattcct	cctgggtcta	taaccaaaaa	aatgaaaaac	35700
tatatccaca	taaaaacttg	tacatgggca	tttatagcaa	cattattcat	aacagcaaa	35760
gtggtaagaa	cccatatgcc	catcatctga	tgaacaggta	aataacatgc	ggtattatcc	35820
atacactaga	atattatctg	cccatacaag	gagtgacatc	cagctacatg	ctacaaggat	35880
gaatctcgga	aaacttatgc	taagtgaag	aagccagtca	caaatgacca	cagattatga	35940
ttccatgcat	cggaaatgac	cagaatagg	aaatctatag	agacagaaag	tagatttagt	36000
gttgggtggg	gctgggagga	caggtagtac	actactttcc	cagaactact	ggaacaaagt	36060
accacaaact	ggggagctta	aacatagaaa	ttgatttcct	cacagttctg	gagactagga	36120
ctctgagatc	aaggtgtcag	cagagctggt	tctttctgag	ggccctgagg	caaggctctg	36180
tcccaggcct	ctctccttgg	ctggcagggt	gccatcttct	ccctgcgtct	tcacatcatc	36240
ttttctctgt	gtgtgcccct	gtccaaattt	tgattggctc	attctgggtc	atggccaatt	36300
gctatgcaca	aagtgaagtc	tacttccaaa	agaagggaag	agggaacact	gactaggcta	36360
aacttatagt	catttttaatg	tccgcttttc	ctatgagatt	gtgaacacac	agaagtagg	36420
tttttatcta	cattgtgcaa	agtttaataa	gaaaaataga	attcaagaga	agcagttcaa	36480
tagcaggaat	ttaatatggg	aactaattac	aaggttttag	gcaggactaa	aaagccagtt	36540
gggatgggtga	gccaacccag	agattagcaa	cagtgggacc	ccatctacct	accacccatg	36600
aagctggaag	gataaaggag	gggctattat	cagagtcacc	aagccagttg	cagagtcctt	36660
ggctggagct	gggaccaccc	tagagacact	gtgcaaagca	gaaaacaagg	gggaaaaacc	36720
ctgacttctc	ccttccctcc	acctttcaat	ctcccactag	tgcttcctac	tagccatact	36780
tggccagaga	cagtgcacaag	gaacactgca	aaatgaagtt	tgtaggaatc	atctccctct	36840
gagacagaga	aatatggaag	ggtagaaaat	gaatcagagg	ataaagagaa	aaaaccctga	36900
gtactatctt	atttatcttt	gtatctccag	tgctaatct	gtctctcaa	aaaggaaagc	36960
aattgagaga	aactgaaaaac	tccaattgaa	atgaaagaat	ggagaattac	tggactagaa	37020
gagaagagaa	aaatttatct	cgcatagagt	aaacaagaat	ggattcacia	aggacgtgat	37080
gaatgaaaa	ctataatcag	caaagatttg	ccagagaaat	taaaaagtgg	taaaactcagc	37140
cacgtgtgac	aacctggaag	cacaatgcac	gaaaacgttt	caagaaatga	caagatttga	37200
agtcaaatc	taagtgtctt	tccagaatct	ctcaagacga	ttatatagct	accccatctt	37260
attaaataaa	atggaaaactt	actaaaacttt	ccccttgat	taaaactaaca	tatgtcctaa	37320
tagcaaacga	ttctgggaatt	cctagatgaa	aatataattc	gtcaaaagtgt	attgtctctt	37380
taatattctg	ctgacctcct	tttgctatatt	aggatatttg	tatacacatc	acacgtaaat	37440
ttggtctata	gtttacatct	acgggcttat	actgttcttt	ttttcatctt	tttaaaattt	37500

72/122

ccaaccccca	gstatccatat	actgctctct	atcagggtta	ttttaacttt	gtaaaatcag	37560
ctgagatgct	ttccatgttt	ttttttttta	ttttctgcca	catttgaata	gcataggagt	37620
taccaccatc	aaccttggat	tatttaagca	ttcacgattc	cacgtgtgga	ttttttattc	37680
agagtctttc	ttgtcattcc	tgctatcagc	acagaaccca	atctcagctt	tccagctata	37740
ctctcacccc	atggaatttg	cagatgaagt	tcaaaaggac	ctttgcatta	tcctgcctcg	37800
ccctcttccc	ccttcattta	gacatcacct	tcttctagaa	cgtcttacct	gacatgccct	37860
gctcccaacc	cctgctgccc	aatttgtgtg	tctcccggtg	cctggcctgc	catcctcttt	37920
agtaattgcc	tgctccctca	tctgtctccc	cacccagaca	ttaagctgaa	tagactggat	37980
ttgtgtcttg	tccatcacta	taatctcagc	acctagtacc	tagtaggtac	ttaccatgta	38040
ttcattagca	aaatgttatg	tataaccttg	caccttaaaa	acaagagaag	gaagacaaaa	38100
ttaagtctta	agactatggt	ttagaacatg	gatcagaaac	tacagtctgc	agcccaaatc	38160
cagaccaa	gaagagacca	tgttcattta	catcaaacct	atagcagctt	tcacactaca	38220
ggagcagagc	taagtgttcc	caagggaaca	cacggccctg	caaagcctaa	aatattttact	38280
ctatagctct	tcacagaaaa	agttttcaga	tccctcgttt	agaactcttg	ttcatatgca	38340
atttcactaa	accatagttt	tttgggtttg	tttgggtttt	tttgcaaaa	aggaatgagc	38400
cgatccagaa	aaagttgaaa	agaatgaatc	attactgctg	aaagaatgtg	cacacagctc	38460
gtcagtatcc	tgctgccatg	ctgacaccca	tccaatagtg	tcatgagatg	cagcagctac	38520
tactgtgttc	tcaatgccga	gtccaccacc	tccataacca	tgtccaagca	atcttgggaa	38580
catcatcacc	atgcttgttt	atccttaagg	tattgcctca	catcacgagc	tggctgggtc	38640
taaagtcaaa	tgacactagt	ggccaggagg	tcaagagaat	gagtggaggc	aggtgggtag	38700
gcagcccagg	ccctagcaac	agcaggagct	cacccctcag	tactctagc	caggactgaa	38760
atacttttca	ccctttcaag	agagactagg	aatctggatt	tttatgtgaa	atatcttgat	38820
tactaaatgt	tgctcaacaga	catgtcaaaa	ggtaaaacta	agtaagttca	tggggcagat	38880
tgactattca	ggttatagaa	ttaaggattc	ttatccaaca	cagataccaa	ccaaaaagct	38940
gacgtataac	atattaggag	aaactatgtg	cactgtcgaa	acatcaacaa	gggggctaag	39000
tctaaaaatg	tctatattgg	attccagttg	aaacatgggg	aaaggacatg	aacaggcaac	39060
ttatgtcaat	ggaaactcaa	aaagataaca	agcatatata	aaagcattct	caaatttcagt	39120
agtaaacaga	cagatgcaaa	taaaaagagg	gaaactgctg	ccgggcacag	tggctcacac	39180
ctgtaatccc	agcacttttg	gaggccgagg	cgggcggtac	atgaagtccg	gagatcgaga	39240
ccatcctggc	taacatgggt	aaaccccgtc	tctactgaaa	acacaaaaaa	ttagccaggc	39300
gtagtgggtg	gcaccagtag	tcccagctac	tcaggaggtt	gaggcaggag	aatggcatga	39360
accaggagg	cggagattgc	agtgagccga	gacccatgcc	ctgcaactcc	gcctgggcga	39420
ctgagtga	ctccatctca	aaaaatataa	taataattat	aattataata	ataataaata	39480
gtaaataaat	aaaaagagag	agactgctaa	agtctagaaa	gttgaaatgat	gccaagcgca	39540
tgcaaaatc	agggccttgg	gatggccggg	tgcaagtggc	cacgcctgta	atcccaccac	39600
tttggggagg	caaggcgggc	ggatcatgag	gtcaagagat	caagaccatc	ctggccgaca	39660
cagtgaiaacc	cggctctctac	taaaagtaca	aaaaaatata	tatatatata	tatatattata	39720
tattatatat	atatatatca	gagccttggg	aatccttctg	tgctgctggg	gaaggtagtg	39780
gtgcagccac	ccttgacagc	aatctggcag	tacttgggtt	tattaagtat	aggcacacac	39840
cacgaccagg	cagtccctact	cctgggtcta	aatcccaaag	aattctcaca	caagtccata	39900
aggagacatg	tacgaggctc	atccagcatt	actgggagtg	ggaatcaacc	tgggtgtcca	39960
tctacaggag	acgagatgga	caaaatgtgg	tggaattata	gaccagaatc	accaagtaac	40020
agagatgggt	ggtgagtgac	aatcctaaga	tacagaataa	aggctagaac	atgatgccat	40080
tcatgtaaat	taaaaataga	tgccacacaaa	gcagtatacg	cgtgaccctt	gaatagcaca	40140
ggtttgaaat	gcctgtgtcc	acttacatgt	ggattttctt	ccacttctgc	tacccccaag	40200
acagcaagac	caacccctct	tcttccctct	ccccctcagc	ctactcaaca	tgaagatgac	40260
aaggatgaag	acttttatga	taatccaatt	ccaagggaact	aatgaaaagt	atattttctc	40320
ttccttatga	ttttctttat	ctctagctta	cattatctta	agaatatggt	acataatata	40380
catcacacgc	aaaataaaatg	ttaattgact	gtttatatata	tgggttaaggc	ttccactcaa	40440
cagtaggctg	tcagtagtga	agtttttggga	gtcaaaagtt	atacacagat	tttcaactgt	40500
gcaggcaatc	agttccccctg	acccccctcat	tgttcacggg	tcaactgtat	atacacaaaa	40560
gtatttatatg	aacctcatta	gaatagctgt	ctataggag	aagagaatga	gagtgggata	40620
aaacggaatg	aacaaataaa	ccaacaaatg	cattaacaag	caaaacaaca	gaggggcttg	40680
catgggcccag	tgatgataaa	gggctaagaa	tgagaatata	attaattcaa	ttcctcacac	40740
ctgaggtcta	aaaccaagga	aagggaaggc	caggcgtgga	ggctcacgcc	tgtaatccca	40800
gcactttggg	aggctgaggc	gggaggatca	caagattagg	agtttgagat	cagcctggcc	40860
aacacagtga	aagcccatct	ctacaaaaaa	tacaagaatt	acccagggtg	ggtggcacat	40920
gcctgtagtt	agctactctg	gaggctgagg	caggagaatc	acttgaaccc	aggaggcgga	40980
ggttgcaggg	agccgagatc	acaccattgc	actccagcct	gggtgacaga	gtaagactct	41040
gtctcaaaaa	aataaaaaaa	ataaaaaaac	agagaaaggg	aggaaactag	atccaggctg	41100

73/122

actagataca	gccttttagag	ttagaaaaga	tgattttgaca	atctaagccc	acactcagat	41160
tgaatgaaat	tgaaaagcct	ttcaaaactaa	aacattttaat	tacaccatct	gctgcagaca	41220
gaactcagac	aactcaaaca	ggtaatgtca	gcgtgggtgtt	ttatatcacc	accctcaaca	41280
cagaataaaa	atcagctgca	tgtgaagcag	tgactagaat	gaagaaaagg	ctgcttctta	41340
cttccttcta	gtgggttcttt	ccgaaaacat	taataggcac	cagctctatg	catgtcaccc	41400
tgccaggaga	catgggggtat	ataactatga	cttactgttc	attcctcaag	gaattcccaa	41460
tcttgtggaa	gattatacac	aatgaggcaa	caaaaactat	ccaataaaac	cacggaaaag	41520
aagccagtga	caaagaagcc	agtgatgaaa	ggccctgtga	gcagagctga	tgggcatttg	41580
gggaagaaaag	accaacatgg	atgggggtga	tcagggtggc	tccgtgggaa	agctggaaga	41640
gaagtggcag	atctctgagc	tggatgatgg	gccactacca	tctgtatatg	gctaattaaa	41700
gaccatgtgt	ggatttttta	ttcagctctt	tcgtgtcatt	cctgctatca	gcacagaacc	41760
caatctcaac	tttcagcta	tattgagcta	aacttctcac	ctcatggaat	ttgcagataa	41820
agttcaaaaag	gacaccttgc	ttttcaaaat	aattttgaat	ggttgagtag	tcctctctgtg	41880
ctctctcact	gcacacctct	caaggctgct	gagcacgtgc	catgctatgg	ctttctccaa	41940
cactcaggaaa	tgttctccac	tcagtttcac	cttaatacaa	atgtgttctc	tcttcagaga	42000
aggcaaaaaa	attcatgacc	atctgactgg	gagaagtcac	ttctaggtaa	agtgtccatc	42060
tttttctgag	gaacacagga	ggaaaatctt	acagaaaaga	gttaacacag	caggcctaag	42120
actgcttttt	aaaaataaata	aataaataaa	ataaataaaa	aataaataaa	taaaataaata	42180
aataaatgaa	tgatagggtc	ttctgtattg	gccaggctag	tctcaaattc	ctggcttcaa	42240
gagatcctcc	caccttggtc	tcccacagtg	ttgggattat	agacatgagc	catttgtgctt	42300
ggcccaagac	tgttatctct	aaaaagtctc	ataaaaagca	tggttaatcc	ttggctggca	42360
cctgggaact	tagatttcag	aagggttccc	accatccaac	ctggaaagag	ggactcactg	42420
tgccataaatt	attgtgtggt	ttatgctgaa	ctcctgcttt	tcttcaggta	gcgtggaatg	42480
gggtctctag	tgagtttccc	ggcctgcat	gaccagcccc	caataaaaac	cctgggtggt	42540
tcggggagtt	aagcacatac	tggtagacag	catttcacat	gcgttgtcac	agctccttcc	42600
gtgcctggct	tcctttggac	ttggcccat	actgactgg	gagaggatgc	ttggaagctt	42660
atcctttcac	tgtataaata	tacagccgtg	gcacctttcc	ctttgctgat	tgtgctttgt	42720
accaccagat	ctgagcatgg	tcttgggggc	agtacaccac	atgctgagtc	ttccaagtga	42780
aaggactggg	catgggtggc	ccccaacaca	atctcagcgc	gaaataaatt	ataaaagacc	42840
ggaccagtta	agcccaaaaag	ttcaaagtta	cagtgcaccta	tttgggaggc	cgaggcagga	42900
aacctgggag	acagagcaag	accctgtccc	caaaaacaata	tgactgcgcc	aatgcactct	42960
cttccaagtg	tcttaaaatt	caatggaatg	gtagaaacat	aactaaacac	atacttctgc	43020
agaaacctgg	aaaacaagag	tgccgatggc	caactaaaat	ttttaaaaca	ctaaatcaaa	43080
gtaaaaagta	ctcagaacca	gattacctga	gcaaaccata	gtctaggaaa	tttctgaaaa	43140
gaggctgtta	tgaggaagga	aatggtaaca	ggtttccagg	gccccaataca	agcttgggag	43200
tagaacagca	gaggtagaac	ctgacaaggt	gattacctgg	aacagacttg	taacagcaga	43260
caggactgtt	ggacccttcc	cctcacatgg	ggaactgcag	ggtactgcag	tctgaatgac	43320
gctcttcaac	aatcacagga	ggcacgctac	aatacacacg	ccactcagca	gcacaccaca	43380
aaacttcgaa	gatgaacaca	taaagaatca	gcctagttaag	acaggaaaaa	aggaattctc	43440
gacactgaat	caacagaaca	caaaccctag	ccaagttttt	attcagtatg	atgaaacagg	43500
attattagat	attcttggga	agacctaaag	caaagataat	tactagagca	catagaagaa	43560
tgacgatctt	tgtgatatac	caagaaataa	ggacattata	aagagcaagc	agttgggtatg	43620
atgtactat	ttgtgcaaaa	aaggagaaat	aaacacagga	tgaagaccag	atagagaata	43680
gcatgaagaa	actttggaaag	gtacataagt	ggagaatctg	attcatattt	gcttgtattt	43740
gcgagagaag	taagaggaca	ggaatggtgg	aactaacaac	aatggttacc	tacttgtaag	43800
tcttgggtctg	acttggagaa	tgaagccgtg	gaacaccttt	tgtgtccgga	attggtgggt	43860
aggcgggtgtg	tctggagttt	gttcttctctg	gacctcgcg	gtgagcgtaa	cagttcttaa	43920
ctgggtgggtt	cgtagtctcg	ctgactcagg	atgtttggat	gtgttcggag	tttcttctct	43980
tacagctctt	aagggggcgc	atctagagtt	agtgaaagctg	cagaccttcg	cgccgagtg	44040
gctagcttca	ggagtgaagc	tgccagacctt	gttcgttctc	cctgggtgag	tcgtgggtctc	44100
tgccagccca	aagagtgagc	agtaataaga	cgagggtgtg	gttgagctc	atatagacag	44160
tcagcagcgc	ggaatgcgac	cgcagcacgt	acgcattcca	aacatcaaaa	ggacaaacct	44220
attctcttat	ctggccacac	ccatatcctg	taccactctt	ggctcgggca	gcctgctttt	44280
gctccatttt	acagagaacc	gatttggtcca	ctgatttggtc	cattttacag	agagccgact	44340
cagagtgtct	attgggtgcgt	ttacaatccc	tttttcagag	agctgattgg	tccattttga	44400
tttacaatcc	cttagctaga	cataaaggtt	tgagctagac	acaggggtgct	gactgggtga	44460
ctggcttcac	ccagtggatc	cggcatcagt	ctcaagtc	caccagactc	aggagccag	44520
gccctgcgcc	cgcactcctc	agccctctgg	gccacaggtg	gagctgcctg	ccagtccgc	44580
ggggtggtgc	tgtcagggag	gctcgggccc	tggtcgatgg	gactgggccc	cgtggagcag	44640
			cacaggagcc	caggagggtg	gggtggctca	44700

74/122

ggcatggcgg	gccgcaggtc	atgagcgctg	ccccgcagg	aggcagctaa	ggcccagcga	44760
gaaatcgggc	acagcagctg	ctggcccagg	tgctaagccc	ctcactgcct	ggggccggtg	44820
gggcgggctg	gccggccgct	cccagtgcgg	ggcccgccaa	gccacgcgcc	accgggaact	44880
cacgctggcc	cgcaagcacc	gcgtacagcc	ccggttcccg	cccgcgcctc	tcctccaca	44940
cctccctgca	aagctgaggg	agctggctcc	agccttggcc	agcccagaaa	ggggctccca	45000
cagtgcagcg	gtgggctgaa	gggctcctca	agcgcggcca	gagtgggcac	taaggctgag	45060
gaggcaccga	gagcgagcga	ggactgccag	cacgctgtca	cctctcactt	tcatttatgc	45120
ctttttaata	cagtctgggtt	ttgaacactg	attatcttac	ctatTTTTTT	TTTTTTTTTT	45180
tgagatggag	tcgctctctg	tcgcccagac	tggagtgcag	tggtgccatc	ctggctcact	45240
gcaagctccg	cctcccgggt	tcacaccatt	ctcctgcctc	aacctcctga	gtagctggga	45300
ctacaggcaa	tcgccaccac	gcccgactaa	TTTTTTattt	tattTTTTTT	ttagtagaag	45360
cggagtttca	ccatgttagc	cagatggctc	caatctcctg	acctcgtgat	ccatccgcct	45420
cggcctccca	aagtctgggg	attacagacg	tgagccactg	cgccctgcct	atcttaccta	45480
tttcaaaagt	taaacttttaa	gaagtagaaa	cccgtggcca	ggcgtgggtg	ctcacgcctg	45540
taacccagc	actttgggag	gccgagggcg	gcggatcacg	aggtcaggag	atcgagatca	45600
tcctggttaa	cacagtgaaa	ccccgtcgct	actaaaaata	caaaaaatta	gccgggctg	45660
gtggtgggca	ccggcagctc	tcgctactgg	ggaggctgag	gcaggagaat	ggcgtgaacc	45720
tgggaggcag	agcttgcagt	gagccgagat	agtgcatttg	ccttccagcc	tgggcgacag	45780
agcgagctc	cacctcaaaa	aaaaaaagaga	aaaatagaga	cccggaaagt	taaaaatatg	45840
ataatcaata	tttaaaaaaca	ctcaagagat	gggctaaga	gttgacggaa	caaatctaaa	45900
tattagattg	gtgacctgca	aaaccagccc	aaggaaacatc	ccagaatgca	gcccataaag	45960
ataaagagag	catttccgct	gggcacagtg	gtatggcagg	ggaattgcct	gagtcgaaga	46020
gttgacgggtc	acattgaacc	acaccattgc	actccaggcc	tgggcaacac	agcaatactc	46080
tgtctcaaaa	aaaaaaaaaaaa	ttaaattaaa	aaagacagaa	tatttgagag	aaaaaaatgc	46140
ttatttcaag	aaacatgaaa	gataaatcaa	gatattctaa	ttcccaagta	agaataaattc	46200
cagaagcaga	aaatagaata	gaggcaagga	aacactcaaaa	acttctccag	tgccatagaa	46260
atgtgtatta	atcttttagaa	tgaaacggac	taccaaatgc	tgagcaggaa	gaacaaaaga	46320
gatccactct	taagccagtg	tggtgcccaa	gcgcagtgcc	tcatgcctgt	aatcccagca	46380
ctttgggagg	ccgaggcagg	tggatcacct	gaggtcagga	gtttgagatc	agtcaggcca	46440
acatgggtgaa	accctgtctg	tactaaaaat	acaaacatta	gctgggtatg	gtggtgcaca	46500
tctgtaatcc	caactacttg	ggaggctaag	gcaggagaat	cacttgaaac	caggagggtg	46560
agggtgtagt	gagccgagat	catgccacac	tcccagcctg	ggtgacagag	caagattcca	46620
tctcaaaaaa	aaaatccact	cctagacaaa	taatagttaa	atttttagaac	accaaggaga	46680
aagaaaaaaa	attgtaaaag	ttcagagaaa	ataaacatta	actacaaaaga	aacgagagtc	46740
agacgcgtgc	acttcttcct	agataccagc	agataaagca	atatctccaa	aattcagaag	46800
gttttaacgt	agaatccctat	acccagtcac	gaatattcac	atggaaaagt	gaaataaaaa	46860
acattgttta	aacatgcacg	ggttcagaaa	gtttaccatt	cacagaatcc	ctgaaaacaa	46920
aaccaaaata	tcacttaagg	actcattaa	aaaacaaaatg	aaataaaaagc	accaatgatg	46980
agtaaaataat	cagaaaaatt	tacagtttac	ctaaataact	gtttatgcat	aatgtatgaa	47040
aacccaaaaa	tttaatatgg	gacagaatta	aaatcatgat	aagattcttt	tttgctttac	47100
tcattggagag	ttcacataaa	cagattatct	tttaatagca	agagaaaaaaa	atgttttagat	47160
atgtgtgaaa	aactaagggt	acaaaaacag	tgcaaatcca	tttatcatca	ggaaaatcca	47220
aattaaaaacc	acagtatcca	ccagaataac	taaaaaggtaa	aagacagaaa	ttaccaagag	47280
ttggcaagaa	tgtggagcaa	ccacatatac	ttctggggta	aataagttgg	tgcaaccggt	47340
actgaaaact	gtttgctagt	atctactaaa	accgagcaca	tgacacagact	acaaccaagc	47400
agttccactc	ccagatacac	actcaacaga	aatgcacaca	ctcactcaac	aaaagacgtg	47460
tactagagtg	ttcatgtact	tactattcat	aatagtccaa	aatgcaaac	aaccaactgc	47520
caatcaaagt	caaatgtata	tctatattag	ggatatatac	aatggcatat	acacagcaat	47580
gagaatgaaa	tgaaccagct	cggcacagtg	gttcattgcct	gtaatctcag	cactttgggc	47640
gggttaaggca	ggcagatcac	ttgaggtcag	aaatttgaga	ctagcctggc	caacacggtt	47700
aaaacctgtc	cccactaaaa	acacaaaaat	tagccgggca	tagtggttgc	aggcctgtaa	47760
ttccagctac	tcgggaggct	gggttgggag	aatcgtttga	acccgaaaagc	cggaggctcg	47820
agtgagcgga	gatcggtcca	ctgcaactcca	gcctggacga	tagagcaaga	ctccgtctca	47880
aaaaaggaaa	tcaaaaatat	aaaaataagat	gacaggaata	atccgcaaaa	gatcagtaat	47940
caaaaataat	ataaatggcg	taaagctacc	tattaaaaga	caaagatttc	acaccataaa	48000
ggatagctac	tatcaaaaaa	agagagagaa	taacagatgt	tagcaaggat	gtatggaaac	48060
tgaattctct	acgcatttgc	ggtgagaata	taaaatgggt	cagcctctgc	ggaaaacact	48120
atgctgggtc	atcaaaaaat	agtaactact	tactactact	gatccaacaa	ttctactctc	48180
gggtatatac	ccaaaataact	gaaagcaggg	tcttgaagag	atatttgtac	acccatgatc	48240
atggcagcat	tattcataat	agctatgatg	tggaaaccaac	ataaatatcc	tttgataaat	48300

75/122

atatggataa	gcaaaatgtg	gtgtatacat	tcaatggaat	attaattagc	aataaaaaatg	48360
aagaaaaatc	tgacacatgc	tacaacatgg	atgaaccttg	agggcattac	attaaatgaa	48420
ataagccagt	tataaaaaaga	caaatactat	atgagggtact	atattagata	ctcatgcaag	48480
gtacctaaaa	taggcaaat	catagagaca	aaaagcagaa	tgggtggtgc	caggggctgc	48540
ggtaatggat	acagagcttc	aattttgtaa	gatgaaaaaa	ttctggagat	tgggtgcata	48600
acaatgtgca	cacacttaac	actgggggaa	tgtaaaactta	aaagtagtaa	atggtaaaaa	48660
taaaaataat	aaataataaa	ttttatgtta	ttttaccaca	atatttatta	aaagacaaaag	48720
attaactaat	taaacaaaaat	ccagccataa	gctaattggt	agagtaacaa	ttaaagaaga	48780
cacagaaaaat	tgaaaaatcag	tgactagaaa	aagatattcc	atataaatgc	taacaaaaaag	48840
caagtacagc	aatataaaga	gaatgaacaa	aaaaaaaatt	aaataagatg	gctcgtttat	48900
tcccaaaagg	tacaattcac	caagaagata	caagaattgt	gaacctttaa	gcacataaaa	48960
cagcttcaaa	aatacaacat	ttaaagaaaa	atatatatata	aacatagaaa	tagtacaaaa	49020
acccctacaa	gaatcataat	gggagtcctc	aatacaactc	tccatatcaa	caggtcaaac	49080
agagaaaaaa	aataagttaa	ggatgcagaa	aacctgaatt	accatcaata	aacttgagat	49140
taatatagaa	ctgtataccc	aataactata	gagttcaggg	aacagtcgtg	actgacagtg	49200
gactgcacaa	taactctgtt	tttaactctt	ttttctcttc	agcactgtgg	cagaatagag	49260
atcctaaaaa	ccttccagct	acaaaacatc	tttttaaaaa	tataaaaaaa	tacaaaaata	49320
actctgaaat	caatagaaga	cacatggtga	aaccaaatt	ctagaataca	gggagaataa	49380
aggcattttc	agatatatac	aaaacagaaa	attgatcatt	gctgaagtaa	tttctaagaa	49440
atgtacttga	gggagaagaa	aaatgttcca	aagaaaagta	tctgtgatac	aagaagggaat	49500
ggaaagtga	gaaatggtaa	acaggtagat	aaagctaata	aatgttgacc	tagaaaaata	49560
caaaaacaat	agcaataatg	tctcgttggg	aggggtgaag	taaaaataca	attaaggcca	49620
aatgtgaggt	aagtgggaatg	aaagaattag	aagtccttgc	cttgttcaca	ggactgatta	49680
aataaatgag	ccaggttttc	cattcaaaca	gttaaaactt	gaacaaaaata	aactcaaatt	49740
aagttagaaag	ataaaaaaca	gaaattaatg	tcatagaaaa	ataaaaaatc	aatagaatta	49800
atcaataaat	cctgggttaat	aaaagctggt	tctttgaaag	gattaataaaa	ataatcatta	49860
agcaagtctg	atcaaaaaaa	aagagaaaaag	gtaccaaaaa	aagtactgta	tcagaaagag	49920
aacatacaga	tacatacaga	tatgtaagag	tctgttttct	tacaccagaa	tactatatac	49980
aacattatgc	tagcatatat	taaatttcaa	taatgttaat	gattttctag	gaaaacagaa	50040
aatatataat	ttactttgaa	gaaacagaaa	aactgagaaa	aataaatgat	catgaaaaaa	50100
atgaaaagg	aattaaatc	tgatattaac	tgcttaaaaa	acaccagcag	cagcccaggc	50160
agtcctgcag	caagttctgc	caaacttgag	ggaacagata	attcttctat	tcagagcat	50220
agaaaatgat	ggaaagtctc	ccaatttaat	cagagaggac	agcctgatcc	ttgttatgaa	50280
cacagataaa	aatggggtaa	actatatgcc	aaactcagat	accaaacc	taataaagat	50340
gctagcttat	tgatgtgaac	aatccaaaag	tgcattttaa	attagcccag	ggttttagag	50400
aaagaaaatc	tagcaatgtg	accaccactt	atgttaacaa	ttttaagacg	aaaatctaca	50460
tgatcatatc	aatgcatatc	acacaaaagc	ttgttggcaa	aaaacccaac	accaccctt	50520
gacttttttaa	actcttagta	attaggcata	aacagaaatg	tacttaatgt	gatagaatac	50580
actcgggtgaa	gatacagagg	gaatgctccc	taaaaccaag	cccaagacaa	agatttcctat	50640
ttaacctcaa	tagtcaaac	tgacgcgaga	gtaatctatg	gaagacaagg	aaaaaagtaa	50700
aaacatgaga	gacatctgtt	gtttaacaga	caataagatc	acctacttgg	aagaggcaaa	50760
cgaatcaagc	gaaaaactat	taaaactgag	acaggcttta	gtatggaggc	tcagcttcag	50820
ctgtagtttg	ggctaccaaa	ttcaactcgc	ttgcttgagg	agttaatcct	gcaaagctaa	50880
ttctctgtga	ggatttagga	tgacaagcc	tgctgctctc	cctcctcccc	catcttcaac	50940
actgaaataa	cacggtgttt	ggaactggat	aacagaatct	tccaaaaaca	aaaattgtcc	51000
tgaagggctg	acttgtgccc	ttactcaaaa	aacactttat	ctgctgcctg	cagctcctac	51060
agttgctggt	ggataagcct	gccaaaccag	tcggcgtaat	tcttctctgca	gagggcaagg	51120
aagagcactt	tcacagggaa	atTTTTTccc	gaactgtatg	ccgcttatta	cataaactta	51180
cgtgctggca	aatggagctc	cagcaaaata	agatatccag	agtcaaaactt	ccttaggaaa	51240
aaaaaaaaaa	aaaagcaagc	acataacact	aatttctctg	catgggcaact	gggggaaggag	51300
gtcgttactt	ccgcacgccc	gcaggtccgc	accaccggga	aacccacggg	caccgcgcgc	51360
tgcccccggg	ccttccaggt	gcactgcgcc	gcggcgcccc	agctgacccg	ggatgcgcag	51420
ccctagccct	tccccgtca	ccccggccag	gaaggggagg	gagcgcgagg	gacgcgcagg	51480
gcgaaggggt	tctcggtcct	ctgcaccacg	cagcaacccc	aaaggcacaac	agggagggtg	51540
cgggaggctc	ccgagaccca	ggagccgggg	ccggcgctgc	ccgcgcacct	gtccactgc	51600
ggcgagggtc	ggggtcgcct	ccagggccgc	agctgtcggg	agccacctgg	ctctcagtc	51660
cgggtccctg	cgcaaacctt	cgggcccgga	ggggaggagg	cgccacactg	ccgctgccac	51720
ctcgggcacc	ggtcccaccg	ctccgggccc	ggcaggacag	gccaggacgt	ccctcctggg	51780
ctggggacag	gacacgcgac	gaggggaccc	gggccccgcg	ggcgaagacg	cagcacgcct	51840
tcccagaaag	gcagtcctct	gccccacaga	cggatggccg	gacccccgcg	ctcgcccgcc	51900

76/122

catcccttca	gaccacgcgg	ctgaggcgca	aagagccggc	cgggcgggcg	gctggcgggc	51960
cggttagtac	tcaccggccc	cgctgggtca	gcgcgcgcgc	aacccccagc	ggccacgggt	52020
ccggcgctc	actgatgctc	aggagagggg	cccgcgctcc	gccggcgccct	ccagccatcg	52080
ccggcagggg	gcgagcgcca	gccgcgcggg	gctcgctggg	agatgtagta	cccggaccgc	52140
cgcttgcgcc	gtcctccttc	agccggcgcc	cgggggcccc	ctctctccca	gctctcagtg	52200
tctcatctcc	ctatctgctc	atcctctggg	cgacataaat	cgatgtttgg	gcgtcccaag	52260
ccagatgtgg	accccatttc	cgactcttac	actggagggt	ttctaagggt	ggtgcccggg	52320
ccagcagctt	cagcctcatc	tgggaacttg	agaâaatgca	gattctccgt	ccccccagc	52380
ctattcggtt	tttcctgcac	taaaaccatg	aaggtggggc	ccagcagtc	acattctcgc	52440
aagccccgca	agtgattctg	aggcgccctc	cagtttgaga	gctatgctca	cggcctcacc	52500
tccgccccgc	aaggagcccg	gtcttgccctg	tggcgctagc	cgcacacgga	cacctcatcc	52560
tgcggggccc	gccccccgc	tcacccctca	ccgcccaacg	cctcctccgg	gatgcagcgg	52620
aggcgctgg	aagtcgggca	ggtcaacatc	cccctcagca	tcttccctac	cctcacgggt	52680
cctcctccag	gggtgcctca	tggccagggg	ttagaaagag	ccactgtgtt	tcttgacatg	52740
gaagtggcct	aagaccttaa	tgaâactgc	aggagtggaa	tgacagaacc	tttggtcata	52800
cttgagggcy	atgagctcaa	atgaggagga	aggâagggat	ccaggagaaa	taaccaaccc	52860
tggcaagtgt	tggcgcccg	gtaggggggc	gagcctagcc	tagcgggtct	cgaccagggc	52920
cggtgttgcc	cctcctcgcc	gccccgcgta	catttgggga	ggtctggaga	catttttggt	52980
tgtcatgatg	cgggagttgc	tactgttgcc	taagtgggta	gacacgaggg	tgctcctcaa	53040
catcctacct	gaaggacagg	actgccccac	aaggaagaat	gatccggccc	caaataagaa	53100
accctgggct	ggtcagcaac	aacccttttg	ttctgagaag	agaggaggaa	agaataaaaag	53160
aagtgggggtg	aagttttggg	ttggtagagg	aaacttgaag	acattttcac	tggaaaggaa	53220
gagaggaaag	ggaggagat	gtctgtaagg	acgagcaaac	cggtgtacag	ctgatttcct	53280
catattgaag	taatgagtc	tagttataat	aaattcctaa	taaaaaacca	gtttatccct	53340
gcaataaact	tgtctttttt	tttâaatat	actgcttgat	tctgtttgct	aataattttat	53400
ttacaggctt	tgcattgata	tgcâââatg	agatgggcaa	taattttctt	tttgaatgtc	53460
taatgttggt	tggtttcaga	atcaatgtta	tgctcacatc	ataâââat	tggaaaccag	53520
gcaggaggag	tgcttgaggc	cagaagtctg	agaccagtct	aggâaacaca	gtgagacccc	53580
cccatctcta	caâââââââ	aaaagââââ	aaaatgggca	tgtttgtctt	ttccttttac	53640
tctgaacaat	ttaaggagca	ttâââattat	ctattctttg	aggtttgatc	atttcccagt	53700
taâââatggt	cctcccagcc	tgatgctttc	tttggggagg	gtâââcttt	taaggctaga	53760
aaagtttctt	ctgtggcaat	tttattattt	acattttâââ	aattattctc	gagttaattt	53820
tgataaaagca	tgtatttctt	aaaacâââat	atcctttttt	tccagatgtt	caagtgtatt	53880
tgataaaagt	tgaggâââgt	agtctttttg	gaatctttta	acttctccca	aatatcttat	53940
tttgtgtatt	tttgccttct	tattttgtta	acttttââââ	gtgtattttt	ttttcâââga	54000
atcagctctt	aggtttatgt	ttttgggtat	actggagctt	ttttcttctt	cttttââââ	54060
tattttttct	cttttatttt	ttagactata	tttgatctaa	cgtaatcgga	agaaggtaaa	54120
ttagaatctt	ttgttactat	tgtgttttta	tttctcctta	tttctctgaa	gtcctgcttt	54180
ataââatagta	ccatgttatt	tgtgcataaa	tattcatttg	tcttatattc	ttgggaattt	54240
tcccacttca	tcataââatg	accttccttg	tctcatttaa	tgtgttcaaa	ctttgccctg	54300
aatttââactt	tgtctgatat	tttaccatcc	tgtcgaattt	tgtttgttac	cccaââââc	54360
ctttgctggt	ttcgtctttt	ctgaaccctt	tatttttaggt	aatcccttga	attagagcac	54420
taagttttgc	tttgtgatta	aatctgââââ	tctttatctt	gccatagatg	agttgagccc	54480
tattcatgtg	acagctatat	tatgctgttt	catagccctt	ttggctcctt	tttactctt	54540
gcattgcata	ttttgtgttt	attgtgtttt	gtgtttcttc	tgataatttg	gaaggtttgt	54600
atttttatcc	agggagttgc	cttataatca	tactccgcaa	tacacatcgt	cctcagtttc	54660
ttcagactgt	ctgttââctc	cctattctga	ataâââatga	cattgtââat	tccctctttt	54720
ttctttaccc	cttttcttct	cctcacctaa	tgtaââatgat	tttatccttc	tttagtattt	54780
gcttttttaa	ttaactacat	ttataââat	ctttatcact	tgatttttaa	atcagctttg	54840
aatgagatat	ttggattcct	agatataâââ	gatgttââat	ataccatttc	cacgttagta	54900
ggtttataaa	atcatacatt	ctgctgtgta	accataatcc	cacgtttgtt	ttagttccac	54960
tcctacagtt	âââagattca	gaagtattat	taacagttat	tttgccatag	ttttttcccc	55020
aacccatttt	gtggtââagtt	atgatcctgc	tttagtttct	taagaataat	ttatagagca	55080
gagtggtgtg	gctcagcttt	gtaatcccg	cactttggga	gacaagaggt	agaaggatcg	55140
cttgââggca	gcagttcââg	accaccctga	gcaacatagt	gagaccttgt	ctctacââââ	55200
aattttââââ	tttagccaga	cgtagtgccg	tgtgcctata	gtcccagcta	ctcaggaggc	55260
tgaggcaaga	ggattgctag	agcccgâââg	tttgaggctg	cagtgcacct	tgattgtgcc	55320
actgcacccc	agtcctggga	agâââagtgag	acctatctc	tttâââataa	caataââaac	55380
ttatgâââat	tatatccct	gagtttttca	tgtttâââââ	tatttgttgc	ctttatcctg	55440
tâââagttg	agtataââat	cttgggttat	actttattta	ttgaagaatg	tataagtatt	55500

77/122

gtcttctaga	attgagtgtt	gctgtaatga	aaccagaagt	cagcctgggt	tatttttccct	55560
cagaaatgag	gtaattgccg	gccggacacc	gtggctcatg	cctgtaatcc	caacactttg	55620
ggaggccgag	acaggtggat	cacgaggtca	ggagattgag	accatcctgg	ctaactgggt	55680
gaaaccccg	ctctactaaa	agtacaaaaa	gttagctggg	catgggtggg	gacgcctgta	55740
atcccagcta	cccgaggagg	tgaggcagga	gaatggcggt	aacctggggag	gaggagcttg	55800
cagagagctg	agatcgcgcc	actgcactcc	agcctgggag	acagagtgag	actccgtctc	55860
aaaaaaacaa	aaaaaaacaa	aagaagtga	gtaattgccca	tgatgctcca	agaattatct	55920
ctttgtctat	gaaatccaga	aatctcactg	ttatacatct	tggaattatt	attctggggc	55980
aataattcct	gggacacaat	agattgactc	tatagattta	attttttttt	tttttttgag	56040
acagagtctc	actgcaatct	cagcttactg	caacctctgc	ctcacggggt	caagcaattc	56100
tcctgcctca	gcctcccaag	tagctgggac	tacaggcgcg	tggcaccatg	cctgggtaat	56160
ttttgtcttt	ttagtagaga	cagggtttca	ccatgttggc	caggctgggtc	ttgaacgcct	56220
aacctcaagt	gatccacctg	cctcagcctc	ccaaagtgtc	gggattacag	gcgtgagcca	56280
ccatgccag	cctcaattcc	tccttctatc	tggttaattt	tcgtgaagttg	aaaacatttg	56340
ttctaatacg	tattttcagt	gttcttctaa	gatgtgtaaa	gcacctatt	cccaggctcag	56400
cccccatctt	gctagttagc	tcggctgggt	cttcacaaga	gctctgggtt	tctcctgctt	56460
aatctcaagt	acctctgtca	gcctccacct	ggtttatgat	ttggagtttt	ttgggtttttg	56520
tttttgggtt	ttgacagagt	cttactctgt	cacccaggct	ggagagcagt	ggcataatct	56580
cagctcactg	caacctctgt	ctcccaggtt	tgagcgattc	tcctgcctca	gcctactgag	56640
tagctgggat	tcaggcgcg	tgccaccaca	cccggtcaat	ttttgtattt	ttagtagaga	56700
tggggtttca	ccatgttggc	cagggtgggtc	ttgaactcct	gacctcaggt	aatccacctg	56760
cctcagcctc	ccaaagtgtc	gagattacag	gcgtgagcca	ccgcgcctgg	catgggtttgg	56820
agttttaatc	tgtagtttta	ataaagatag	tgcttatgtt	tgtgtttcct	atatctcttg	56880
gtactcttgg	gtaatttgtta	agatcccat	atctacacaa	gaagtccatt	ttcaattctt	56940
ttcttcagac	tgtttatttt	attttatttt	attttatttt	tatgtttgag	atggagtctc	57000
gctgtgtcac	ttctggaggc	tggaagtgcag	tggtcgatc	tcagggtcact	gcaacctccg	57060
tctcccggtt	tcaagcaatt	ctcctgcctc	agcctccga	gtagctggga	ttacaggcac	57120
ctgccacttt	ttaatttttt	tagagacaga	gtctcgcttt	gttgaccagg	ctggagtgcg	57180
gtggtgcaat	catggctgac	tataacctcc	aaatcctggg	ctcaagtgat	cctcctgcct	57240
cagcctcctg	agtagctggg	actacaggca	catgccacca	tgcccagtta	atttttaatt	57300
ttttgtagag	acaggggtct	catatgttgc	ccaggctggc	ctcctactcc	tggcctcaag	57360
taatctcctc	acctcagcct	cccaaatctc	taggattata	agcatgagcc	accatgccca	57420
gccttgttct	actactttta	tttcatatgt	taggtgacca	tgtaattgat	catccaaacc	57480
aggatactgt	aagaatgaaa	gaggctgaca	gtagtatgat	gctgggacta	gcatttgtgca	57540
ctgagattat	ttctgggaaa	gcaggagata	cggtcacctc	acttatagtg	tgcttgtctt	57600
tggattgttg	aatttggagt	ttctatttgc	aggcttattt	caactgggca	gccttgatcc	57660
gccctgcccc	gcaatgctac	cgttctctcc	accgggtctc	tggtgacctc	tcagtactca	57720
tacttagctc	agtccccac	cctccactcc	cctaaaagcg	taaccaggaa	tcctgcctca	57780
ggctactgct	cgtcttccgt	gggtgttttc	agttcctatt	acccagagtc	aaactcccag	57840
cattccctac	ctgattccag	acttggagtc	cagagcttta	acctcttcag	gccaactccc	57900
cactttgcat	ttctgtccct	atatcttagt	ccatggagat	acatttcatg	tctttgagtc	57960
tacttacaaa	gtaaattttg	ctgtttttta	attttttttt	tgagatggag	tcttgccctg	58020
tcacccaggc	tgtgggtgcaa	tgacgccatc	tcggctcact	gcaacctccg	cctcctgggt	58080
tcaagcgatt	catctgcctc	agcctcccaa	gtagctgtga	ttacagacag	gcaccaccac	58140
gcccagctaa	ttttttttat	cttttagtag	agacagggtt	tcaccatgtt	ggccaggctg	58200
gtcttgaatt	cctgacctcg	tgatctgccc	atctcgccct	cccaaagtgc	tgagattaca	58260
ggcgtgagcc	actgtgcccc	gccaattttg	ctttttttat	atttccattgc	tatatgttta	58320
gaggataagt	ttacagtgtc	atatgcattc	ccaaatatta	gaccaaataa	atctccaaaa	58380
aattagaaaag	aaaatccaaa	aaatctcaaa	aaataccaaa	aagcaacaat	ctcacagacc	58440
atactcactg	acccccaata	aaataaaatt	agaaattaac	cacaacttaa	caaaaataag	58500
tactcaagtc	agagaggaaa	gaggaaaata	acatcaaaat	tacaaagtct	aggcggtggc	58560
tcacgcctgt	aatcccagca	ctttgggagg	ccaaggcggg	cagatcacaa	ggtcaggaat	58620
tcgagaccag	cctggccaat	atgggtgaaac	cccgtttcca	ctaaaaatac	aaaaatttag	58680
caggcatagt	gatgtgtgcc	tgtaatccag	ccacttggga	ggctgaggca	ggagaatcac	58740
tgaaccagg	gagacgaaga	ttgcagttag	ccaaaatcgt	gccactgcac	ttcggcctgg	58800
gtgacaaagc	gagactccat	ctcaaaaaaa	aaaaaattac	aaactcttta	gatagaaatt	58860
ttggtgtttt	ttttttgagac	ggagtctcac	tctgtcgcag	aggctggagt	gcagtgggac	58920
tatgtcagct	ccacgcaacc	tccatctcct	ggattcaagc	aattctcctg	tctcagcctc	58980
ccaagttagct	aggattacag	gcgcccacca	ccagaccag	ctagttttta	tatttttagt	59040
agagatgggtg	tttcaccatg	ttggccaggc	tggtctcaaa	ctcctgacct	caagtgatcc	59100

78/122

acctgcttca	gcctcccaaa	gtgctcagat	tacaggcggtg	agccaccgca	ccccacctag	59160
atagaaat	caacatgagg	ccggggcaca	tggtctcacgc	ctgtaatctc	agcacttcag	59220
gaggctgagg	cgtgggagga	tcacttgggc	ccaggagtcc	aggaccagca	tgggtgacag	59280
agacagaccc	tgtctctatt	tatttgaaaa	aaaaaaaaaa	aaagagagag	agaaaagaaat	59340
ttcaacatga	aaagtatctc	tcaaacctct	cgagatgttg	gcaaaaagcg	actcaaagga	59400
aaatgtatta	ctgtgtgtga	at ttgcttga	aaataagaaa	gaggccgggt	gtgggtggcta	59460
acacctgtaa	tcccaacact	ctgggagtcc	gaatcaagt	gatcatgagg	tcaggagatc	59520
gagaccatcc	tggctaacat	gggtgaaaccc	tgtctctact	aaaaatacaa	aaaattagct	59580
aggcgcggtg	gctcatgcct	gtaatcccag	cactttggga	ggctgaggca	ggtggatcac	59640
ctgaggtcag	gggttttgaga	ccagcctggc	ctacatgggtg	aaacctcgtc	tcttctacaa	59700
atacaaaaat	tagctgggag	tggtgggtggg	tgctgtaat	cccgactact	cagaggctga	59760
ggcaggagaa	tcgcttgaac	ccgggagggcg	gaggttgccg	tgagccgaga	tcgcaccact	59820
acactccagc	ctggggcaaca	gcctgggtga	cacagtggaga	ctccatctca	aaaaatacaa	59880
aaaattagct	gggtgtgggtg	gcctgcgcct	gtagtcccag	ctacccggga	ggctgaggca	59940
ggagaatgga	gtgaacctgg	gaggaggagc	ttgcagtga	ccgagatccc	accactgcac	60000
tcagcctggg	gcgacagagc	aagactcttg	tctcaaaaaa	aagaaaaaaa	aaggaaaaaa	60060
gaacctgat	aataaagaaa	ccaaatgttc	aactctcaaa	gctcggacac	tttaaagaaa	60120
taattaataa	aggcagaagt	taaaggagg	atgataaagc	aatttttttt	gttgggtttt	60180
ttgagatgga	gtcttctctc	gtcaccagg	ctggagtgc	gtgatgcgat	cttggctcac	60240
tgcaacctct	gcctcccggg	ttcaagcaat	tctcctgcct	cagcctcctg	agtagctggt	60300
actacagggtg	cgcgccacct	ggccccagta	at tt ttgtat	ttttattaga	gacgggggtt	60360
caccatattt	gttaggtcgg	tctcaaaact	ctgatctcag	gtaatctggc	cacctcggcc	60420
tctcaaaagt	ctgggattac	aggcaggcgc	caccgcgcct	ggcctaaagc	aaaatattgg	60480
ttctgtgcaa	aagggtcaata	aaaagagcaa	acgtttacaa	actggagcca	gcacccattc	60540
agctcagtgt	gtctggagaa	aaaacaatct	cgcttcagaa	ttcatgatta	cgcagccctt	60600
tttgcttccct	aaaaatecta	ctatgttgct	gttgaccatt	ctctctcttt	ctctctctct	60660
tgctttctct	ccagaaaagc	tattcagaca	ttctctcttt	tcctcaaacc	tccaacactt	60720
cctcctccat	ccttagcctc	agctgctgac	ctcacttcta	atcattgaga	aaccaggaga	60780
agcat ttaag	agtgaacctc	cgctcccgcg	cacgggcaaa	accacccacc	cacagaattg	60840
tgccccaat	ctgcgtctct	tcctctcacc	atggatggac	ggtccaggct	ccgagccaaa	60900
gccaggcctc	ccctggagct	ctggatccac	cacctgcagc	ttctcaggca	gggccccagc	60960
agctcccctg	ctccccttgta	ccatcaatcc	ctcccctcac	tggtgcactc	ccaacaatat	61020
atatatttag	tgatgtttct	cccattgtgt	aaaatcactt	agcctctctc	ctccccagc	61080
tactatccta	tttgtttctt	tccattctct	gcaaaaactt	tcaaaagcatt	gtgtctatgt	61140
gctgactcca	tttatcttct	cccgttctct	gctgagtoct	tcccacagac	tctcacccca	61200
gttactccat	gaaatgacct	ctgcactgcc	acatccaatg	gtgaatgttc	agttcttaat	61260
tttattcagt	ctttgacag	catttgacct	ggccgatcac	tccctcttct	taaaaaact	61320
tttctcagcc	aggcgtgatg	gctcacacct	gtaatcccaa	cactttggga	ggccaaggcg	61380
ggaggatcat	gagagcccag	gagttcaaga	tcagcctggg	caacatggca	agaccctatc	61440
tctacaaaaa	ctaaaaagta	gccagtgtga	tggcatgcac	ctgtagtccc	atctacttag	61500
gaggctgagg	cagtaggatg	acttgagcct	gggaaatcaa	ggctgcagtg	agccatgatt	61560
gcaccactgc	actccagcct	gagtgacagc	gagaccctgt	ctcaaaaaga	caaaaatagga	61620
aacttttctc	agcatattcc	tctgattctc	ctgctgcttc	tgtctgcaca	gattcagctc	61680
cctttgcggg	ttcttctctc	tcctcctgat	ctcttgacct	tgaagtgcct	cagagtacag	61740
tctttttttt	ttttttttgag	acgcagtctc	gtctgtcacc	caagctggag	tgcaatggcg	61800
aggctctcagc	tcattgcaacc	tctgcctcct	gggttcaagc	gattctcctg	cctcagcctc	61860
ccaagtagcc	aggactacag	gcacatgcc	ccatgcccag	caaattgttg	tatttttagt	61920
agagacaggg	ttttactata	ttggccacgc	tggtctcaaa	ctcctgaact	cgtgaaccac	61980
ccgcctcggc	ctcccaaaagt	gctgagatta	caggcatgag	ccaccacacc	cggccccagag	62040
tacagtcttt	agacggcctc	tctacctata	cttgctcccc	tcataaaact	ctcctgcctc	62100
atggctttaa	ataccatcgg	tagactgatg	actcccatat	ttctcttttt	tttttgagga	62160
cggagtctcg	ctcagtcctc	caggctggag	tgagtgggcg	cgatctcggc	tactgcaag	62220
ctccacctgc	caagttcaca	ccattctcct	acctcagcct	ctccagtagc	tgggactaca	62280
ggcaccgcgc	accacgcctg	gctaattttt	ttgtattttt	agtagagatg	gggtttcacc	62340
atgttagcca	gatctcctga	gatctcctga	cgccatctct	cgccatctct	ggcctcccaa	62400
agtgtcggga	ttataggtgt	gagccaccgt	gcccagccga	tgactcccat	atttctatct	62460
cttgctgtgt	gggagttctc	ctcagaactc	cataactcata	aatccaactc	tcataaatag	62520
tatctcaaat	gggcaaatag	ctcaaaagtc	aattcctact	tttctcccta	aacttgcttt	62580
cctgcagtct	ccaccatctt	aatgtccaat	ctaaccattag	gaggcaaaaa	ctttgaagtc	62640
attcttgact	cttctctatt	acacacctta	tccaatcttt	ctgcagatcc	agtcgacccc	62700

79/122

caaatccagt	tagctctcat	catctcccct	gttaccacct	gggtccaggcc	atcttctctct	62760
ctcacctgaa	tcactgcagc	attctcctca	ctgggtctctt	tgggtctgtt	ttcactccac	62820
cttagcatag	tctccacaga	gcagtcagag	ggatcctttt	aaagtgtaat	tcccatcctg	62880
tccctgctct	gctcaaaacc	ctgtcgtgat	tcccggttta	atctgtcaga	ttaaaagcca	62940
gagtccttcc	agtgaacctac	atgatctgcc	tattatcacc	tcccacttct	ttccccttgc	63000
tcactccact	ccagctctgc	agctgtcctt	tctgtttcct	gaacagccca	gatttttgctt	63060
ctttagaacc	tttgtatttg	ctgtcccctc	tgtctgggaat	gtttttccag	gaagtcacct	63120
ggctctctcc	tgcacttctt	tcctgaccac	catgtttaaa	aatcactcaa	acacacttca	63180
ggcgggacat	gggtggctcac	gcctgtaatc	ccagcacttt	gggaggccaa	gggtgggtgga	63240
tcacctgagg	tcaggagttc	gagaccagcc	tggccaacat	gggtgaaactt	cgtctctact	63300
acaaatacaa	atagtagcca	gggtgtagtg	cacacacctg	taatctcagc	tactcaggag	63360
gctgaggcag	gagaatcgct	tgaacccaga	aggcagagga	gggtgcagtga	gccaagatca	63420
cgccacaaca	ccccagcctg	ggtgacagag	caagacccca	tctcaaaaaa	aaaaaaagaa	63480
aaaaaaatca	cacaaacaca	cttctcttca	tattcctttt	ccaagtttta	ttttctctca	63540
gaatacttta	cattgtttta	atggaagtte	tccgtttccc	cccaactaga	atggatactt	63600
ctgcaggta	tcctccctag	tcctccctag	caagtactaa	ccaggctcaa	ccctgcttag	63660
cttctgagag	caggggagat	caggcctggt	caggggtgta	tggcccagga	attttgattc	63720
tgttttatte	attgctgttc	tgttgattct	cttttgttcc	tcctcctagt	gctgagaaca	63780
ctacttgtac	ataataagca	ttcaataaat	atttgtgaa	tgaatgactt	gttgaatgaa	63840
ttaatctcag	aaatgcagga	ctggtttctac	attagaaaat	ttttcaaggt	cattctctgt	63900
tgtcgttaaca	cattaagaga	ggaaaatttt	gtactctaaa	tcatttgata	aaatacatat	63960
tgattttctgt	tttcaaaaac	tcttagtggc	tgggcgaggt	ggctcacatc	tataatccca	64020
gcattttggg	aggacgaggt	gggcggatca	cttgaggtca	ggagtttgag	accagcctgg	64080
ccatcatggt	gaaaccctat	ctctactgaa	aatagaaaaa	ttagccgggt	gtggtggcgc	64140
atgcctgtag	tcccagctac	ctgggaggct	gaggcaggag	aatggcttga	accggggagg	64200
cggaggttgc	agtgaagccaa	gatcatgcc	ttgcactcca	gcctgggtaa	cagagtggaga	64260
ctccatctca	aaagaaaaact	cttagtgagt	ttaggaatcc	aaggaagacc	ctcaaaactaa	64320
atagataatc	tagctaccag	aagccttcag	taaaccttaa	cactccatgg	tgaacatta	64380
gaaacattcc	tactaaaaga	caggctaaga	atgcctgcaa	tcttcacggc	tagtccaaga	64440
agtcaaaaag	aagaaatgag	cgctgattta	aaaaataaaa	caaacaaaaa	actaccgatg	64500
cagaggctgg	cagcaaggac	tgaaggactg	tacagtactt	gcctggagca	ggcggatggc	64560
cacaccctcg	cgaagcctgc	tcagctggct	gggggacgct	ccagtgtgtg	agtggcagga	64620
tgcagggtac	ttcctctgcc	agggagttgc	actggggaga	tcctccccc	ctcacacttt	64680
ggcagctggg	gctttggaat	gtgacttagc	ttctgtcaaa	gggtcaatcc	accctttgat	64740
atatgatgca	aaggcgaaca	tatgatgcaa	aggtgagaga	acagcccaaa	ttaggacttt	64800
taccacagct	gtggagggtg	acagcgacag	tgggtggccc	tggccagact	tttcatgctc	64860
aaaggtggtg	gttgttcttc	ctacttcttg	tcctccagg	gcttcttttg	cctgtgtgct	64920
gaacctgctt	cttttaattt	tttttaactt	ttttaaattt	ttaatgtgtt	taattaaaac	64980
aaattttgaa	aactgtctga	acctgctttt	gaacctgtct	atgatttgaa	tgtttgtccc	65040
ctgccaact	gattttgaaa	cttaactctc	aaagtggcaa	tattgagatg	gggctttaag	65100
cagtactggg	atcatgagag	ctctgacctc	atgagtggat	taatggatta	atgagttgtc	65160
atgggagtg	catcagtgcc	tttataagag	gaagaattaa	gacctgagct	agcatggctg	65220
ccccttcacc	atttgatata	ttacactgcc	taggggctct	gcagagagtc	cccaccaaca	65280
agaaggctct	caccagatac	agctcctcaa	ccttgtactt	ctcagcctct	gtaactgtaa	65340
gaaataaatg	ccttttcttt	atgaattacc	cagtttcaga	tattctgtta	taaacaatag	65400
aaaacgaact	aaggcaaaact	ctcatgattc	tactgccatg	ccattccaat	aaactccctt	65460
tatgcttaag	agagccagag	ttggccaggc	gtgggtactc	acgcctgtaa	ttccagcact	65520
ttgggaggcc	gaggcagggtg	gatcacaagg	tcaggagatc	gagaccatcc	tggctaacac	65580
gggtgaaacc	cgtctctact	aaaaatacaa	aaaaattagc	tgggcgtggg	agtgggtgcc	65640
tgtagtccca	gctactcggtg	aggctgaagc	aggaggagaa	tggcgtggac	ccaggaggcg	65700
gagcttgca	tgagtcgaga	tcgtgccact	gcactccagc	ctgggtgaca	gaatgagact	65760
ccgtctcaaa	aaaaaagaga	gccagagttt	atttctgttg	cttgcaacca	agaaatctgg	65820
ctgggtgact	gaagtttcca	taaataatag	caatttaaag	actctttcca	agccaggcaa	65880
tgcctagcct	tgtgtagtcc	ttgtggtaat	acattcattc	attcatttgt	tcaaccaact	65940
gtgctcaga	gactaagaat	acaaaaatgg	gggccgggtg	tgggtggctca	cacctataat	66000
cctagcactt	tgggaggccg	aggcaggtag	atcacctgag	gtcaggagtt	cgagaccaac	66060
ctggccaaaa	tgggtgaaacc	cctactctac	taaaaataca	aaaaattagc	tgggggtggt	66120
ggcgacacc	gttaatccca	gctactcggt	agactgaggg	aggagaatca	cttgaaccgc	66180
ggaggcagag	gttgcagtga	gccgagatcg	caccactgca	ctccagcctg	ggcaacaaga	66240
gcgaaactcc	acctcgaaaa	aaaaaaaaaa	aaaaaaagag	ggccggggct	gggcgcagtg	66300

80/122

gctcacgcct	gtaatcccag	caactctggga	ggccaaggca	ggagaattac	gaggtcagca	66360
gatcgagacc	agcctgacca	acatgggtgaa	acccccatctc	tactaaaaat	acaaaaatta	66420
tccgggcgtg	gtggcgacaca	cctctagtcc	cagctacttg	ggaggctgag	gcaggagaat	66480
cgcttgaacc	cgggaggcag	aggttgcagt	gagccgaaat	catgccactg	cactccagcc	66540
tgggtgacag	agtgagactc	cgtctcaaaa	aaaaaataaa	aaaaaaaaaa	gaattcaaaa	66600
attgtagagt	tatagtgtgc	ttctagttta	gttgagagga	catctgtcct	tcaaggaagg	66660
ctagaatcta	taccctgagt	ccttactgaa	atcaatccag	cagtcaaaac	atgggacca	66720
cgatcacagc	agtaagatag	gaagagcacc	tttgtacatt	tagctcatgt	tgagataagc	66780
cactgacaga	gctgaaggaa	gctcacagtt	ctgggttcca	tcctttggca	tttaaaaaga	66840
aaagtgctaa	gaaaattcgg	ttggtcacgg	tggtcacgc	ctgtaatccc	aacactttga	66900
gaggccaagg	caggcagatc	acgagggtcag	gagttcgaaa	ccagcctggc	caacatggtg	66960
aaaccccgtc	tctactaaaa	acagaaaaat	tagccgggca	tggtggcgca	tgccataaat	67020
cccagctact	caggaggtg	aggcaggaga	attgcttgaa	cccgggaggg	ggaggttgca	67080
gcgagtgaag	gcaggccact	gcactccagc	ctgggagaca	gagcaagact	ctgtctcaaa	67140
aaaaaaaag	aaaaaaagaa	agaaaggaaa	aaaagaaaaga	aaaaaaaaga	aaaaagaaaa	67200
ttcaggccag	gccaggcctg	gtggctcaca	cctgtaatcc	caacactttg	ggaggctgag	67260
gcgagacggt	gccttagccc	aggagtttga	gaccagcctg	agcaacatag	cgagaccctg	67320
tctctataaa	aaaaaat ttt	tttttggcca	gacgcagtgg	ctcacgcctg	taatcccagc	67380
actttgggag	gccgaggcag	gtggatcacg	aggtcaggag	atggagacca	tcctggctaa	67440
cacggtgaaa	ccccatctct	actaaaaaat	acaaaaaatt	aaccgggcgt	ggtggcgggc	67500
gcctgtagtc	ccagctactc	gggagggtga	ggcaggagaa	tgccgtgaac	ccgggaggcg	67560
gagcttgacg	tgagccgaga	ttgcgcact	gcactccaga	ctgggagaga	gtgagactcc	67620
gtctcaaaaa	aaaaaaaaaa	aaaaaaaaat	taattgtcag	gtgtgctggc	atgcagctgt	67680
agtcctagct	actcgggagg	ctgaggtaag	aagatcgctt	gagcccagga	gttcaaggct	67740
gcagtaatag	tgcccttcac	tctaccctgg	gtgacaatga	gacctctct	caaaaagaaa	67800
gaaaaaagg	aaagaagaaa	agaaagaaa	aaagagaaga	aaggaaggaa	gaaagaaaga	67860
aaaagaaaag	gaaggaagga	agaagaaaaa	aaaagaaaaga	aagaaaagag	agagaagttc	67920
aaagaccaaa	gggtcaggat	cccaaaatag	tttttatggt	ttattttatt	atttacttat	67980
ttatttttga	gacagtatgg	ctctgtcgcc	caggctggag	tgcaagtatg	cgattgcggc	68040
tcactgcagc	ctccaaactg	ggctcagggtg	gccctcccac	ctcagcctcc	cgagttagctg	68100
ggaccacagg	cgcgtgccac	catgccacgc	taattttttg	attctttgtg	gagatgaggt	68160
ctctatatgc	tgcccagggt	ggctctcgagc	tcctgggctt	aagccatcca	cccgcctggg	68220
cctcccaaag	tgctgggatt	acagaagtga	gccaccgcgc	ctaactcggt	ggtttggttg	68280
ttatttgacg	gggtctcgct	gctgcccagg	ctggagtgcc	agtggctggt	cacagggtga	68340
gtcctggagc	attgcatcag	ctcttgggct	ctagcgatcc	tccagagtag	ctgcagctgg	68400
gattccaggc	gcgccaccgc	gcgggggtca	gaattgggtt	ttatatttag	ggttatgctg	68460
ccacctagag	gatatatgta	gtaccgaact	gtgtgcgcag	ggaggctgag	gttgacgtga	68520
gccaaagatga	tgccagggca	ctccagcgtg	ggtgacagag	caagatttca	tctcaaaaaa	68580
aaaaaaaaaa	aaaaaaaaaa	aagaattgaa	agtaaggctc	tgaagagata	tttgtgcctg	68640
tatggtcata	gcagtattaa	ctttgaccca	ctagctaaaa	cacaaaagca	acatgtgtct	68700
gtcagcaggt	gaacggataa	acaaaatgtg	gtatatatgt	acaattgaat	attattcagc	68760
ctttaaaaag	gaataaaaag	ctggatgcgg	gggctcacgc	ctgtaatcct	aacactttgg	68820
gagactgagg	tggggtggatc	acccgagggt	aggagtttga	gaacagcctg	gccaacatgg	68880
tgaacttca	tctctactaa	aaataactaaa	attagccggg	catggtggca	cttgtctgta	68940
atccaagcta	ctggggaggc	taaggcagga	gaattgcttg	aactcaggag	ccggaggttg	69000
cagtgcagta	agatggcacc	actgcactcc	agcctgggca	acagagttag	actccatctc	69060
aaaacaaaca	aacaaaaaat	tattatttcc	aaagaacaaa	gacctgggt	ccatttccca	69120
gccacacct	gatgttgact	cacaacacac	agcctgggtt	gctatgagcc	tgcttcattt	69180
aattgtcacc	ttactctcac	atcacctcca	agtcctggaa	taactctttg	ctgacctttg	69240
tgtgctgagc	catctccatg	tcgctcaacg	tgcagtccct	ctcactgcac	tgagtcaata	69300
gccagacgtg	gtctgactgc	agggtcatcc	ttggtggctt	agggtgactc	gggcatagca	69360
gggtgctctg	agacctcacc	gcataatagg	tttgccccc	ataaactcta	tataatattc	69420
atattatgtg	gtctgggtgt	gtgtagcttt	gcactgtctt	ctcgtgacag	tgccctcaac	69480
ctctttccca	ggatttcttc	ctctacctcc	tcaagtccca	ctgctctgca	aagaccaaaa	69540
gctgcagagt	ccagctccc	tcctttacac	ccacagacgc	agcctcctct	ctcagaaccc	69600
tttaaacaga	gtcttttact	gcagatccca	agaacagcca	cacctctctc	tcccaccac	69660
tccagacaca	cccaggtaat	tatagcacc	agggtaacta	tgtagatgga	gtccctggaa	69720
catgtggata	gtgccccctg	ggagtatgca	aaagcaacat	tgctggcacc	tgacagaaac	69780
aggggtgacat	ccaggaatca	gagcatgggc	ctctgggagg	tagggatgtg	gccaggcagg	69840
ctgccaaaaa	ttggtagagc	aaggccacag	gatctttctg	accttccttc	caaacagagg	69900

81/122

ctcctgtact	ggtgatccct	gtgttgattg	accactccct	tccctgggggt	cgtggtctct	69960
gtcccagttg	cccggacttc	tgtgagtgtc	ctactgaggt	cctttttcatg	agaagcatgc	70020
tgtccttcca	cctgctggga	gcaagagtga	caacttcaat	actataatag	cagtggcata	70080
cagagaagaa	gaaagatgaa	gtggcaagaa	aaacaggctt	ccaagcagga	gtttttctat	70140
aaaaacaaaa	acgtttacaa	gcaaaactttt	tataaagggc	tagatagtaa	atatttttagg	70200
ctttgagagc	cacatagact	tgtttgcagg	gactcaatgt	cgctattgta	gtttgaaagc	70260
agccatcagg	gttatgtaaa	tgagtgagtc	tgattttgtt	tcagcaaaat	tttatttacc	70320
aaaacagaca	atgagtgggc	tggatttggc	ccatgatcct	tagtttgcca	actcctgctt	70380
tgggctcacc	cagatctgat	tttgaattct	ggctctgcta	ctggttagct	gcaggagctt	70440
ggaaggctct	ctgagcctgt	ttcctcatct	gtaaaattaa	agcaataatt	tctaaccactc	70500
aagagtgtta	cctcacgcct	gtaatcccag	cactttggag	gctgaggcag	gcggatcacc	70560
tgaggtcaga	agttcaagac	cagcgtggcc	aacgtggcaa	aaccctgtct	ctactaaaaa	70620
atacaaaaag	tagccgggca	tgggtggcgc	catctgtaat	cccagctact	tgggaggctg	70680
aggcagggat	actgctagaa	cctgggaggt	ggagcgtgca	gtgagtggag	atcacacctc	70740
cacactccag	cctggccgac	agagcgagac	tccatctcaa	aaaaaaaaaa	aaaaagagtg	70800
ttagaaggtt	agagataaat	gaataaaaga	gcctctgtgt	atactaaagta	ttcaacaact	70860
gatagctgca	ttggtctaata	tataacagtt	tagaagcgat	tgagtcaaca	aatgctggat	70920
ttgtcagggg	ggacttccta	tcaggaggta	gatcttgggc	tgagtcctga	agcaaaagata	70980
ggcattggat	agaggagtgt	agagaacacc	ctaggactgt	tattattatt	attcgacacg	71040
gagtctcttg	ctctgtcacc	caggctggag	tgcagtggcg	cgatctcggc	tcactgcaac	71100
ctctgcctcc	caggttcaag	cgattctcct	gcctcctaag	tagctgagac	tacagggtgtg	71160
tggcaccaca	ccggctaata	ttttatattt	ttagttagaga	cagagtttca	ccatgttggc	71220
catgctggtc	tcgaactcct	gacttcagggt	gatccaccgc	cctcagcctc	ccaaagtgtc	71280
ggaataacag	atgtgagcca	ccgcaccagg	cccagaacca	tttttcaatc	cttggctctg	71340
ccttttatta	gttgcaagat	ctcaggcaat	ttatttaacc	tctccaaaga	ctcattttct	71400
cattcacaaa	atgaggcaaa	taataatatc	tactatccca	ggttgtcatg	agaattaaat	71460
gcaacatgac	atttaatgaa	atgagaagtc	ccttggacat	taactggcta	aagtatgtgc	71520
tcgacaagga	tatcatttta	ggtggatact	tagcatctca	gaactgatgc	tcacaatgga	71580
atatcattga	aacgcattaa	aattcatttt	aaatgattgt	aggtagtgag	gcaattgaaa	71640
gaagaagaca	agaggactga	ttataatgct	tcaggctcac	tagtctcctt	ttaggaggga	71700
aaaacaattt	caagttaaat	tttaggctct	agatttttac	cctgctgctg	cattagaatc	71760
accagatttg	atgaaatcag	agcccatctg	aggctgtggt	tttcatctcc	agaatgagag	71820
ctgttgtggg	gattaaagttt	ttgaaaaagt	acatctaaca	ggtgatcgaa	aatgatagtg	71880
atattattgc	agtgatggtc	attattgttg	ttattattat	actgaaagag	gcttcagttt	71940
tctgatccat	aaagtgaggg	aattgcatga	gaccattgct	aagattcctt	ctagctctgt	72000
ttttttgttt	ttgtttttta	gacagagtct	ctgtcgccca	ggctggagtg	caatggcatg	72060
atccttggctc	ccgcctcccg	ccgcctcccg	ggttcaaatg	atcctcctgt	ctcagcctcc	72120
gaagtagctg	ggactacagg	cacacaccac	catgcccagc	taacttttat	atttttaata	72180
gaggtggggg	ttcaccatat	tggtcaggct	ggtctcaaac	tcctgacctc	agggtgatcca	72240
cccgcctcgg	cctcccaaca	tgctgggatt	acaggcatga	gccactgtgc	ccaaccctt	72300
ctagctttct	tgatcactga	ttctagggtt	ctctgctgaa	atatatttga	gacatcctgg	72360
ataaaagatc	atgcaagagc	tcccaatatg	gtattaataa	ttgattctgg	aggcttagct	72420
actcctgatg	gattagacat	gactcaactg	cctctcttat	gtgtacaaca	caacaacaca	72480
accaagaaag	gttattctgg	cattccattt	attcagttta	tttacagccc	ttacttccag	72540
cagcacgtta	aagatatggc	cagggccggg	tgcagtggct	caagtctgta	atcccaggac	72600
tttggggaggc	caaggtgggc	ggatcacaa	gtcaggagtt	tgagaatctg	gcaattcttc	72660
agacttagaa	gcaaccagct	cgataacaca	gtcttgtgtg	ggctctccct	ctgtccctcc	72720
ctcgcttccc	tcattttcca	tccttgcctc	tgagactgtg	caccttcaca	tagccctgcc	72780
atgagacctt	catctcaggc	tttgctttct	ggggttaactg	aggctaaaca	ctgagtggcc	72840
ctaaaagagg	attgggattt	ggaagttaga	ttattcacca	gagaacagac	tttgctgatg	72900
atcaggccca	ggttgttaatt	gttgaaaaaa	agagaggatg	catagtctta	tctcatctcc	72960
tagtcaaagt	caacaccatg	ataaataaga	gtcaaatcct	gagatgtgaa	ttggggagcat	73020
ttgagtgggt	aaccctgaga	agcttgcacc	ttcagacccc	tcaatacccc	tgctccccag	73080
agaaggctgg	acattgacct	cagcacaggc	aggagccctg	caagatgcca	tttgtcctac	73140
taaaagatga	ccctccact	ctgtttctag	gtcaataaacc	aaagtcaagt	ctccacacag	73200
cctgagcaag	aaagtccagag	cctgctacag	gagaaaatac	cacactggcc	aaaggattca	73260
ctagccctgg	ccactgtgtg	tgggaggaac	caggggaatca	tgtgtggggag	tcaatgttga	73320
agctgttggg	ctgggggtgg	ggtggaatat	aagcctggcc	ctggggagtt	tttcccgttt	73380
gagggccttt	accacacaact	caagatccag	tgctatagca	ggagatccca	gagctagtcc	73440
taacagatgg	ctaggattga	acttggccta	gagtaaaatg	aggaggatag	tgccagaact	73500

82/122

ttctcaacat	actattgagg	aagaggtcag	aaggcttaag	gaggtagtgt	aactggaaa	73560
gggtcctgat	ccagacccca	ggagaggggt	cttggacctt	gcataagaaa	gagttcgaga	73620
cgagtcaccc	cagtaaaagt	aaagcaattt	tattaaagaa	gaaacagaaa	aatggctact	73680
ccatagagca	gcgacatggg	ctgcttaact	gagtggtctt	atgattatct	cttgattcta	73740
tgctaatacaa	aggggtggatt	atttgtgagg	tttccaggaa	aggggcaggg	atttcccaga	73800
actgatggat	ccccccactt	ttagaccata	tagagtaact	tcctgacgtt	gccatggcgt	73860
ttgtaaactg	tcattggccct	ggaggggaatg	tcttttagca	tgttaatgta	ttataatgtg	73920
tataatgagc	agtgaggacg	gccagaggtc	gctttcatca	ccatcttggt	tttgggtgggt	73980
tttggccggc	ttcttttatca	cctcctgttt	tatgagcagg	gtctttatga	cctataactt	74040
ctcctgccga	cctcctatct	cctcctgtga	ctaagaatgc	agcctagcag	gtctcagcct	74100
cattttacca	tgagagtcgt	ctgattccaa	tgccctcgac	agcaggaatg	ttggaattga	74160
attactatgc	aagacctgag	aagccattgg	aggacacagc	cttcattagg	acactggcat	74220
ctgtgacagg	ctgggtgggt	gtaattgtct	gtggccagg	gtggactgtg	ggagatgcta	74280
ctactgtaag	atatgacaag	gtttctcttc	aaacaggctg	atccgcttct	tattctctaa	74340
ttccaagtac	cacccccccg	ctttctcttc	cttttctctt	tttctgattt	tactacatgc	74400
ccaggcatgc	tacggcccca	gctcacattc	ctttcttat	ttaaaaatgg	actggggctg	74460
ggcgcggtgg	ctcatgcctg	taatcccagc	actttgggag	gccgaggcgg	gcggtatcatg	74520
aggtcaggag	atcgagacca	tcctggctaa	cacggtgaaa	ccccgtctct	actaaaaatg	74580
caaaaacatt	agccaggctg	gggtgcaggt	gcctgcagtc	ccagcggtct	aggaggctga	74640
ggcaggagaa	tgggcgtgaac	ctgggaggtg	gaggttgcaa	tgagccgaga	ttgtgccact	74700
gactccagc	ctgggtgaca	gagcgagact	ccgtctcaaa	aaaaaaaaaa	aaaaaaaaaa	74760
tagctgggca	tggtggcgcg	tgccgttaat	accagctact	ctggaggctg	aggcaagaga	74820
atcgctgaa	cccagtaggc	ggaagtgtca	gtgagccgag	atcttgacac	tgcaactccag	74880
cctggtgaca	gagtgagact	ctgtctcaaa	aaaaaaaaaa	agaaaaaaa	agacagaaa	74940
aaagagcaca	gacagagtca	caggtatttg	cagtaggaag	ctgtcagggt	agagtgcacg	75000
gaaatagaaa	gtatatttta	cacttacagc	acatcttcgt	ttgattagcc	acatttaaaa	75060
tactgaatag	caacgtgtgg	ctatttagta	ttcactaaaa	tcttggacag	tgcaagtcta	75120
aagaatcctt	gatccgtccg	gcattggtgc	tcacgccttt	aatcccagca	cttggggagg	75180
ccaaggtgga	aggatcactt	aaggtcagga	gttcgagacc	agcctggcca	acatggtgaa	75240
acctcgtctc	tactaataat	acaaaaaaa	ttagccgggc	atggtggtgc	atgcctgtaa	75300
tcccaggtag	ttgggaggct	gaggcaggag	aatagcttga	atccaggagg	cgctgcagtg	75360
agccgagatc	atgccatgcc	actactgcac	tccagcctgg	gcaacagagt	gagactgtct	75420
caaaaaaaaa	aaaaaaatg	ttgggcgtgg	tggtcacgc	ctgtaatccc	agcactttgg	75480
gaggctgagg	gggggtggatc	acctgggttc	tgaggttcga	gaccagcctg	gccaacatgg	75540
tgaaacccca	tctctactaa	aaatacaaaa	attagctggg	cggtggtggtg	ggcacctgaa	75600
atctcagcta	ctcaggaggc	tgaggcagga	gaatttcttg	aaaccaggag	gcagagggtg	75660
cagtgcagca	agatcgcgcc	tctgcactcc	atcctgggtg	gcagagcaag	actatgtctc	75720
aaaaaaaaaa	aaaaaaatc	ttgattgtct	ggacattctg	cagaacatca	tatggagaca	75780
ctatgttgac	gacatcatgc	tgattgtaag	caagaaatgg	caagtgttcc	agaaacacag	75840
tcaagacaca	tacatgccag	aaggtgagat	ataaactcta	ctaagattca	gtggcctgcc	75900
acactggtga	cattttttaa	cctgctagat	gtttgtgtag	aaaaggattt	aaccttgccc	75960
aaagaggggt	ctggcctttg	tccccagcta	ctggacataa	tctcttttaa	ctcttgaat	76020
atcattcctg	atagaagtat	ttttgttttg	actagggggc	ttggggccagc	cagatagcaa	76080
caatgtgatc	tggtgtgggg	gctttggatc	aggtggcatc	agtgtgacct	cctgagtggc	76140
tagagactag	aatcaaccac	atgggcagac	aaccagctt	acatgatgga	attccaataa	76200
agactttgga	cacaagggtc	tggttaagct	ttcctgggtg	gcaatgctct	atactgggaa	76260
acccattctg	actccatagg	gagaggacaa	ctggaatttc	tcatttggtg	cctccctggg	76320
ctttgcccta	tgcatTTTTt	ccttgtctga	ttattattat	tattatgaga	tggaatctcg	76380
ctctgtcacc	caggtctggag	tgcatgtcaa	tgatctcaac	tcactgcaac	ctctgcctcc	76440
ccggttcaag	cgatTTTTct	gtctcggcct	cccagtagc	tgggactaca	gatgcatacc	76500
accacaccgg	gctaattttt	ttgtattttt	agtagagacg	gggtttcacg	ttagccagga	76560
tggtctcgat	ctcctgacct	catgttccgc	ctgcctcggc	ctctcaaaag	gctaggaata	76620
catgtgtgag	ccaccgcgcc	cagcccccct	ggctgattat	taaagtgtat	ccttgagctg	76680
tagtaaatata	taaccgtgaa	tataacagct	tttagtgagt	tttgtgagca	cttctagcaa	76740
attatcaaac	ccttgggtag	ccttgggaact	ccttgaactt	gcagttgggt	tcagaaataa	76800
gggtgctcat	gtgtgtacca	tgccctctaa	ttttgtagtt	aattaacttt	cacaacttta	76860
ttattaccgc	ttacactcaa	tgtttattca	catttatcca	cataccactt	attctagtgc	76920
cttgcatcaa	agactttcta	tttattctgc	tttattctgc	ttgaagtaaa	tccttttagga	76980
tattcttttt	tttttttaaa	ctttgcacat	acatactttt	attttttatt	tatttttaaa	77040
tttgttattt	ttgtgggtac	gtagtagata	tatgtattta	tgagtagacat	gagatgtttt	77100

83/122

gatacaggca	tgcaatgtga	aataagcaca	tcattggagaa	tgggggtatcc	atcctctcaa	77160
gcaattttatc	cttcaagtta	caaacaatcc	aattacactc	tttaagttat	tttaaaatgt	77220
acattttaatt	ttgtattgac	tagagtcact	ctgttggtgct	atcaaataata	attttttttt	77280
tttttgagac	agagtctcac	tcagtggccc	agactgaaag	tgcaagtggca	caagctcggc	77340
tcacttcaat	ctctgcctcc	ctgggttcaag	cgaatctcct	gcctcagcct	cccacatagc	77400
tgggattaca	ggcacacacc	accatgccc	gctaattttt	atattttttt	agtagagacg	77460
ggttttcgcc	atggtggcca	ggctgggtctt	gaactcctgg	cctcaaatga	tctgaccacc	77520
tcagctcctcc	aaagtgtctag	gattacaggc	atgagccacc	acacctggcc	aaaatagaat	77580
attcttttagt	gaggtctgct	ggtgacaatt	ttttctttt	ttttgagact	gagtctcgct	77640
gttgtagag	tgaggctggag	tgcaatagca	cgatctcagc	tcactgcaac	ctccacctcc	77700
cggattccag	caattctcct	gcctcagcct	cccaagtagc	tgagagatta	caggcaccca	77760
ccaccacacg	cggttaattt	ttgtattttt	agtagaaatg	gggggtcacc	gtgttggcca	77820
ggctgggtctc	gaactcctga	cctcaggtga	tccaccacc	ttggcctccc	aaagtgtctg	77880
gattacaagc	atgagccacc	acgcacagcc	aattttttcc	gtttttgtct	gaaatcttat	77940
tttgtgtcat	ctttgaaata	tattttttgat	ggatataaaa	ttgttgggtg	atagttatta	78000
tcattattat	tattattttg	agacagggtc	gcctatgctg	gggtgtagta	gggtgtagta	78060
atgtgatctc	ggttcactgc	agacttgacc	tcctagggct	caggtgatct	tcccacctca	78120
gcctccctag	tagctgggac	tacagatgca	tgccaccata	cccaactaat	ttttctattt	78180
tttttagaga	tgaggctttg	ccacatttcc	caggctgggtc	tctaactcct	gagctctagc	78240
aatccaccca	ccttggcctt	acaaagtgtc	gggcatgac	tagccagcag	ttacttttta	78300
tagcatattg	aatatttaat	atgaatcttc	tggcatccac	tgaactgtt	taaaaaatca	78360
gctgttttact	ggcactcctt	tttttttttt	ttttttttga	gacagagtct	tgccctgtcg	78420
cccaggtctgg	agtgcagtg	cgtagctctg	gctcactgca	agctctgcct	cccgggttca	78480
cgccattctc	ctgcctcagc	ctccggagta	gctgggacta	aaggcgcccg	ccaccacgcc	78540
cggctgattt	ttttgtattt	ttcgtagagt	tggggtttca	ccgtgttagc	caggatgggtc	78600
tcgatctcct	gacctcgtga	tctgtccgcc	tcggcctccc	aaagtgtctg	gatttataggc	78660
gtgagccacc	gcgcccagcc	tctttttttt	tttttttttag	acggagtctt	actctgtcat	78720
ctaggctgggt	gtacagtggtc	gtgatctcag	ctcagtgcaa	cctccacctc	ctgcctcagc	78780
ctgccaaata	gctgggatta	cagggtgcgt	ccatcacgcc	cggctaattt	ttgtattttc	78840
agtagagatg	gggtttcacc	atgttagaca	ggctgggtctc	gaactcctgg	cctcaagtga	78900
tctgcctgcc	ccagcctccc	aaagattaca	ggcatgagcc	accgcacccg	gccaagttagc	78960
actcctttga	aggtaatctg	cttcccctac	ccctagcaat	ttttaacaat	ttttctttat	79020
ttttattttc	tgaagttttg	ttattaataa	tctgtgtgca	gatttctttg	tatttctttt	79080
gtttgcagtt	catagtgtat	cttgaattag	tgtgttgggt	tctgttatca	ccacaggaaa	79140
attgtcagcc	gttagctttt	caaatatttc	cttgctaaat	tctctcttct	ccccttttcg	79200
tacaattgat	ttgattaaaa	ctaaaaccag	ggcgggtgct	agtgactcat	gcctgtaatc	79260
ccaacacttt	gagaggctga	ggcaggtgga	tcacctaagc	tcaggagttc	aagaccagcc	79320
tggccaatat	ggtgaaaccc	cgtctctact	aaaaatacaa	aaattaccag	gcattggtggc	79380
acacatttgt	agtcaggagg	ctgaggcagg	agaattgctt	gaatccagga	ggtggaggtt	79440
gcagtgtgct	gagatcccac	cactgcagtc	tggcctgggc	gacagagtga	gatgagaatc	79500
tgtctcgaaa	aaaaaagtta	tgaatgtttg	ataaactata	tttgtagaa	tgtttgttgt	79560
agaatactat	tcattgattt	ttaaacaatg	ttagattaaa	ccattcactg	gatttgtgat	79620
aattaactta	ctgattttac	ctcactgatt	tgttgttaatt	aatacaactg	gtataaaaag	79680
actgtgacga	ggccggggcat	ggtgggtccc	gcctataatc	ccagcacttt	gggagggtga	79740
ggcaggcgga	tcacctgagg	tcaggagttc	aagaccagcc	tgaccaacat	ggtgaaaccc	79800
catcttttact	aaaaatacaa	aattagccgg	tcgtgggtgt	gcattgcctgt	aatcccagct	79860
cttcggggagg	ctgtggcagg	agaatcactt	gaaccgggga	ggtggagggt	gcagtgtgac	79920
gatatcgccg	cattgcactc	cagcctgggc	aacaagagcg	aaactccgtc	taaaaaaaaa	79980
aaagaaaaaa	aacacataaa	acaaaacaac	actgtgacgg	ttcccaaaaa	ttaggagcat	80040
aattaaagga	actcctgata	aaaatttaatt	ttatcttaca	tgtaaactaa	aatgacttta	80100
tgaagttaat	tcagaaatac	aatgcagggt	attagtttgc	cacagctgcg	tattcagcct	80160
aatgtaatat	tcttgttatt	tttaaatctt	tccttttaact	ttactcatat	gtggatcatc	80220
aaatttcaaa	agattaaatg	acaatactct	tagcagcaag	cttccctaag	catataaaca	80280
tttttaattgg	tgatgattca	gaaggtaccc	gaagaatatg	tactgccaga	tatcattcac	80340
ccccatatac	ctgcccagaca	gacatcccat	tttgggaccc	tgataaaatg	tgtgggtgga	80400
gagaaagata	ggagaaagtg	gtataagcaa	atggctttgg	agtcgtgattg	acagcgattg	80460
aaatcctgtc	tctacctctt	aacagcctca	tgatcctaca	taagttaccc	cgatcctcag	80520
ggccacatct	gtaaattggg	ggttgcgatg	gcagccatct	cacagggtct	cttttcgggg	80580
aagggcagga	attatggatt	aagtgtgacta	gtaattgtaa	agcacttaat	acaaggaggg	80640
cgcataataa	gtacttcata	aataatgacg	gccattatca	tgactgaggt	gtatgcagct	80700

84/122

gtcggggatt	acggcgactt	cagaattttct	gggtgggcagg	gctcaaaggc	agcaaatcac	80760
actggaagtc	gaggtgaggc	actgcttctg	cacagactgc	ttagctggag	agaatgagga	80820
aggcttagag	gagatttaga	ggaacttaga	gtcctccgcc	tccaactctg	tgggactctgc	80880
tcccgtgcca	gagacattca	ggggatttct	cgcactctcc	cctcccctac	gtcccctccc	80940
ccccatccaa	ctaaccacac	aacacatata	aaatagcccc	tgcgagggtc	tgcaacgctgg	81000
aagggaaacag	gagaagggcg	ctgcgcttct	ttgctgatgc	cctgtacttg	ggcccctggg	81060
agacacagcc	acttgtcccc	tcagcctgca	gagaaatccc	acgtagaccg	cgcccgggtc	81120
cttggtctca	gccaatctcc	ctttgggtgg	gggtgggatgc	acgatccaa	gttttattgg	81180
ctacagacag	cggggtgtgg	tccgccaaga	acacagattg	gctcccagg	gcattctcgga	81240
tcccgtgggtg	ggcgccgctc	agcctcccgg	tgcaggcccg	gccgaggcca	ggaggaagcg	81300
gccagaccgc	gtccattccg	cgccagctca	ctccggacgt	ccggagcctc	tgccagcgtc	81360
gcttccgtcc	agtgcgcctg	gacgcgctgt	ccttaactgg	agaaaggctt	caccttgaaa	81420
tccaggcttc	atccctagtt	agcgtgtgac	cttgagcagt	tgactttatt	tttcagtgcc	81480
tagttttcca	gataccagga	ctgactccaa	ggactattac	tcattctggag	ggtttagcac	81540
agtaccgtcg	catagtaaat	ttccatgtca	gttttgggtta	cctttcatgc	acttgcaaac	81600
atagtgatgt	ctgaaacgaa	ataggcacat	cttttttttt	ttttttttta	aggagtcttc	81660
ctctcgccca	ggctggagtg	cagtggcgcg	atcttggctc	actgcaacct	ccacctccc	81720
tggtcgagat	tctcctgcct	cagcctcctg	attagctggg	actacaggca	tgccacgacg	81780
cccagttaat	ttttgtattt	ttagtagaga	cggggtttcg	ccattctggc	caggctgggtc	81840
taactcctga	cctcaggtga	tctgactgcc	tcagcctctc	aaagtgttgg	gattacaggc	81900
ataagccact	gcattctggc	agaaatgaaa	taagtaaatc	ttttaacctg	ctctaacaat	81960
atagtgaaaa	gacatattta	ttattagagc	aggttaaggg	atttgccat	ttcgggttct	82020
agttatagtc	ttaaacttgg	acattcttgt	agaaagtaaa	aagtttcctc	ttcaaagttc	82080
cccttcttgt	taaagaatac	atcataagt	ttagaagtaa	tagtttattt	taaagactaa	82140
ctttcttcaa	gctccttgc	tttgtgttaa	taactctttg	ttaaagccct	tcctatgtaa	82200
ctgttgagca	tgctcacagg	caggttccag	ttcacagcct	atgccccttc	cttatttgga	82260
aatgttattg	cttccctaaa	cctttcggta	agcaacttcc	tctccttctt	cgttcttctc	82320
tgcaacttacc	tatttagaaa	gttttaggct	attagcaaat	cggctatcag	tttaagagt	82380
tgaggctccg	ctccagccaa	tggtatgcagg	acatagcagt	gaggacgacc	caaatgcgta	82440
agggataaat	atgttttgctt	ttcctttgtt	cagggtgtgt	ctcgacatcg	ttccatctgc	82500
gattgagcac	cctttctgca	gaaagtaaa	attgccttgc	tgagatcttt	ttgtctccgt	82560
gctgactttt	cttcgtggca	ccgattatct	atttctaaca	attttgggtat	ttctaacatt	82620
ctgaacaatc	ttgggctagt	tgtctcttct	gggctgtgtt	ccccatccgt	cacatgataa	82680
acttcattgg	tttaaaaacc	ccagcgaa	ttatttgagt	tactattacc	ttcctgccct	82740
ccccaaaccc	aaccccgagg	agcagttaca	acctcagccg	ctgagcgcac	tcgccgggtg	82800
ttaagaagca	ccaaagacag	ggaggcttga	ttgattttgc	tttgggagta	gagggtcaga	82860
agattcacag	gaaaatggca	tttgagcaag	gatgattcac	tgagctagc	ttttaaatc	82920
tggcgaggct	tttatgttgc	agtcctctac	aaagttagag	attcgcagg	actgcactcc	82980
gaaataagcc	cgtctcccct	tttcattcgc	taatgatcca	gggagctgct	ggttccgcgt	83040
gcggcgaggt	gtgccttttc	ctaatacagg	ttctgcatcg	cctcgaaccc	gcaggccgtg	83100
gcgggttctc	ctgaggaagc	agggactggg	gtgcagggtg	aagctgctcg	tgccggccag	83160
cgctgtgag	caaaactcaa	acggaggagc	aggagggtc	gagctggagc	gtggcagggt	83220
tgacctgccc	ttttagaagg	gcacaatttg	aagggtaccc	aggggcccga	agccggggac	83280
ctaaggcccc	ccccgttcca	gctgctggga	gggctcccgc	cccaggaggt	tagttttgca	83340
gagactgggt	ctgcagcgct	ccaccggggg	ccggcgacag	acgccacaaa	acagctgcag	83400
gaacggtggc	tcgctccagg	caccagggc	ccgggaaaga	ggcgcggtta	gcacgcgcgg	83460
gtcacgtggg	cgatgcgggc	gtgcgcccct	gcacccgcgg	gagggggatg	gggaaaagg	83520
gcggggccgg	cgtctgacct	cccgtgaagc	ctagcgcggg	gaaggaccgg	aactccgggg	83580
ggcgggcttg	ttgataaat	ggcggtgga	gctgcctggg	catcccagag	aggcggtggg	83640
gcccactccc	ggaagaagg	tcccttttgc	cgctagtga	gcggcccctc	tggaaccgga	83700
agtcggggcc	ggttgctgaa	tgaggggagc	cgggcccctc	ccgcgcaggt	ccccccgcac	83760
cctccgtccc	gacccggggc	ccgccatgtc	cttcttccgg	cggaaaaggta	gctgaggggg	83820
cgccggcggg	gagtcaggcc	gggcctcagg	ggcgccgggtg	gggcagggtg	gcctgcgagg	83880
gctttcccga	agggcggcagc	aaggccttca	gcgagcctcg	acctcggcgc	agatgcccc	83940
tgagtgcctt	ggtctgctcc	gggactcttc	ttggaggag	aaagtgccct	tcttgccgga	84000
ggtcagagga	gtattgtcgc	gctggttcag	aagcgattgc	taaaagccat	agaagttcct	84060
gcctgttttg	ttaagaacag	ttcttaggtg	ggggttagtt	tttttgtgtt	tctttgagga	84120
ccgtggatca	gactcaagga	aatctcttta	gaaccttatt	atggaagtc	gaagtttcca	84180
aatgttgagg	gttttatgtc	taaaagcaac	acgtgaaaaa	attgttttct	tcacccagtg	84240
ctgtcttcca	atttcctctt	tggggggagg	ggtagttact	gctgttacta	aaataaaatt	84300

85/122

acttattgct	aaagtcccc	aacaggaaga	ccactacttt	tgatgacttt	ggcaagtttg	84360
ctaactactg	gaaccctaac	ttacaaacga	actacttaca	tttttgattt	ccagtttgat	84420
tacctgcca	atgtttacgt	agaaacagct	taattttgat	tctgggtaac	gttgttgac	84480
ttcattaaaa	atacatatcc	gaagtgagca	agtatgggtc	tgtggacagc	agtattttt	84540
cctgtcaatt	cctgttgctt	cagataaaat	gtaccagaca	gaggccgggc	gcggtggctc	84600
acgctgttaa	tcccagcact	ttgggaggct	tggcgggtgg	atcacctgag	atcgggagtt	84660
caagaccagc	ctgaccaaca	tggagaaacc	ccgtgtctac	taaaaataca	aaattagcca	84720
gggtgggtgg	gcatgcctgt	aatgccagct	acttggggag	ctgaagcagg	agaatcgctt	84780
gaacctggga	ggcggagggt	gcggtgagcc	gagatagcac	cattgcactc	cagcctgggc	84840
aaaaagagcg	aaactccgtc	tcaaaaaaaa	agtaccagac	agaaatgggt	tttgttttct	84900
ttttttgttt	tgagacggag	tttcgctctt	gttgcgccag	ctcgagtgc	atggcgcgat	84960
ctcagctctc	gctcactgca	acctctgtct	cccagggtta	atcgattctc	ctgcctcagc	85020
ctcccaagta	gctgggatta	cccatgcccc	accatgcccc	gctaattttt	gtatttttag	85080
tagaaacggg	gcttcaccat	gttaggctgg	tcttgaaccc	ctgacctcaa	gtgggcctcc	85140
cacctcgcc	tcccaaagt	ccaggattac	agggcaggtg	caccgcgcc	agccagaaat	85200
gggttttggg	aaaagcacta	aacaaaaatc	aacttgggtt	catatgacag	ctctgctgct	85260
aactgtaaac	ggggcagacc	agttaaccta	cttttctgtc	ttctgtcagc	tgagaattag	85320
atgattccca	aaggccatt	gaactctgaa	tgactttaaa	tacttcttct	taagtgggta	85380
ccaggttttg	gtaactgatg	ccagggtgat	aatgcatgaa	agtgtctaat	gaatgaaacc	85440
ggtaaaatag	taggaggaag	ctttattggt	aaggcagggg	tataccta	agctctctaa	85500
tttattggta	ttgaagtgg	taacttttgt	ttttttaagg	ggggaaaaca	ttctaagaat	85560
aatgaggcaa	actgcatatt	gcacaagaga	ctgttgtctc	tattcaacaa	ataccttttg	85620
agtgtccaga	gtctgcagg	tgctgtgcta	ggccctcacg	attgagttag	gaaccagaga	85680
atgtccctgc	accatggag	cttattgtct	actggggtag	acagataata	aataagcaaa	85740
caaatcttct	ctcttctccc	tttcgctcca	tgtaagtgtg	tgtgtatagg	tgtatactta	85800
caagttgagt	aaagtgttat	gaaagattaa	gaggagaaat	gcattttggg	tagatgttag	85860
aggactcagc	agggtacctt	gaaacttaga	gctgaaggat	cagtaggagg	taactagaga	85920
ggccaggga	tcgcatgttc	aaaggccagg	aggcaagaaa	gagcatgggt	cccttcaaga	85980
gaggaagaa	ggctactgtg	actggagcat	agatgtaggc	aagtgttggg	tgattgagag	86040
ctctacgggc	catggttagg	ttttattcct	aatgccgaga	tgccaaacat	ggtggttc	86100
atctgtaac	ccagtatttt	aggaggccga	ggcaggaata	tagcttgaac	ccaggagttc	86160
aagaccagcc	tgagcaacat	gagacctgta	caaaacattt	aaaaaattgc	tggttatgat	86220
ggtgcacacc	tgtggtccca	gctactcagg	aggtcgaggc	agaaggatca	cttgagccta	86280
ggaggtggag	gctacaatga	agtcactaca	agtcactaca	ctccagcctg	gatgacaaag	86340
tgagaccatg	tgtcaacaaa	aatacagaaa	gaatattaat	ttaaaatttt	gaaagaggag	86400
tgatctgaac	ttatatctta	aaaagatcat	cttagggcat	ggtgggtcat	gcctgtaatc	86460
aagggctttg	ggaggctgag	acaggaggat	caactgaggc	cagttcgaga	tcaacctgta	86520
cagcatagag	agactccatc	tctacaaaaa	gaaaaaataa	atagctgggt	gttgtgagtt	86580
attcaggagg	ctgaagcaga	aagatcactt	gagccaggga	gtttgaggct	gcagtaagct	86640
atgatccac	cactgcaaca	cagtgaatc	ttgtctcaaa	aaaaaaaaaa	aatcattcta	86700
ggtgcttttt	ggaggctgga	tgtggtgaaga	gtagaagctg	gagatggtcc	tgtagggat	86760
tcgattcaga	ctttaaatac	catcaatgca	ttgagtccca	aatttacatc	actacgttgg	86820
atccttgccc	ctgaatccag	atcggatat	ccaactttag	gttcagtttg	tatctctacc	86880
tgaccaatat	agagggtgct	agtcttttgg	cttcocctagg	ccacattgga	agaagaattg	86940
tcttgagcca	cacatagagt	acactaacgc	taacaatagc	agatgagcta	aaaaaaaaatc	87000
gcaaaactta	taatgtttta	agaaagttta	cgaatttgtg	ttgggcacat	tcagagccat	87060
cctgggcccgc	gggatggaca	agcttaaatcc	agtagatacc	ttcaacttac	aatatctaaa	87120
attttatgcc	agatttagtc	attttaaacc	tgctcatcag	tttttctcaa	gaagtagtat	87180
tttggctttt	tttcttttct	tttttttgag	atggagtttc	gctcttatcg	ttcaagctgg	87240
agtgcagtg	cggatcttgg	ctcactgcaa	cctccgcctc	ctgggttcaa	gtgattctcc	87300
tgctcagcc	tcgcaagt	ctggaattac	agggcatg	caccatgacc	agctaatttt	87360
tgagagcagg	gtttcaccat	gttggtcagg	ctgggtttgt	actcctgacc	tcaggtgatc	87420
tgctgcctc	ggcctcccaa	aggctgggat	tacaggcatg	agccaccgct	cccggctgca	87480
tttttgatt	tttagttgct	cagcccaaaa	cttttagtaca	tctttgaacc	tcttctttcc	87540
tctactcta	tatctgatcc	atcagcaaat	ctgttaggtc	tacctcacac	atatcgaaat	87600
cctaccacgt	ctcaccatct	gtgacaatta	acaccctggt	ctaggcagtc	atctctgtta	87660
agattgagtg	gttaaggatg	tcctctaagg	agatgacatt	caaatcttag	cttaaatgtc	87720
aagagggagc	ttggtttata	agggcagcatt	agggcagcatt	attttgccat	aggcttccat	87780
ttgggtttcca	ttccattctt	gatacttatg	gtatatattc	aaaacaaatg	cacagaacaa	87840
gaccaggtta	tattgggaat	ttcgatata	gagttcctag	ttgggaaaag	atagactgat	87900

86/122

ctgtaaatga	tgctagttat	ccatcatctg	gcaaaaaata	atttcctgcc	tcctctcata	87960
tatctcagat	caacagactt	tttctgttaa	gggcccatac	ataaatat	taggctttcc	88020
agaccatatg	gtttctgtca	cactctcctt	tatccttgaa	gccatagaca	atatgtaaac	88080
aaatgggcat	ggctgtgcta	cgataaaact	ttacttacaa	aaactggtag	tgggccagtt	88140
taggcatggc	cagcactttg	ggagggtaa	gcagatggat	cacttggggg	caggagtttg	88200
agaccagcct	ggccaacatg	gtgaaaccct	gtctctacta	aaaatacaaa	aaatagctgg	88260
gcatgggtgt	gggtgtctat	aattccagct	actctggagg	ctaagacaca	agaatcactt	88320
gaacccagga	ggcagagggt	gcagtgagct	gagatagcac	cactgcactc	cagccagggt	88380
gacggagtct	taaaacaaaa	caaaacaaaa	ggtagtgggt	tgtatttggc	ccatgggctg	88440
tagtttgcca	atccctgatg	cagaaacaaa	ttccaggtaa	ataagagcct	ggaatgttaa	88500
aaaaacaaaa	cttgaagtca	tgtagaagaa	caggtagggg	gaacaatcct	gatctcagga	88560
taggaaggga	tattgcttaa	aataagacac	aggaaaaat	aatccatgtt	gtgtaaat	88620
gactacgtta	aaacttaaaa	ctttcgccaa	gcgcgggtgg	tcacgcctgt	aataccagta	88680
ctttgggagg	ccgaggtgag	cagatcacca	ggtcaggaga	ttgagaccat	cctggctaac	88740
acggtgaaac	cccgctctta	ctaaaaat	aaaacattag	ccgggcgtgg	tggcgggcgc	88800
ctgtagctcc	agctacttgg	gaggctgagg	caggagaatg	gcctgaaccc	gggaggcgaa	88860
gcttgacagt	agctgagatc	gcgccactgc	actccagcct	gggcgacaga	gtgagattcc	88920
gtctcaaaaa	aacaaaacaa	aacaaagcaa	aaaacttaaa	actttcatac	aataaagtat	88980
acctaagata	cttctagaag	agaagattta	catccaggac	gtgtatggaa	tttctgcaag	89040
taataagtaa	aagacaaggg	acatgaagag	gcagttcaca	aaagagggaag	ccaaaatgac	89100
caataaacat	gaaaggatgt	ttaacctcaa	aggaaacaag	gaaatgaatt	aaaaacatca	89160
aatgcccatt	caaaactagt	aagttggcaa	aattaaaaat	accaaggatg	agaatatgaa	89220
gcatggctat	atgagtgcac	ggaatggtac	agtcactttc	attaaaaatg	cacataat	89280
gttttttatt	tatttttttg	agacagtcta	tgtcgcccag	gctagaatgc	agtggcatga	89340
tctcggtcca	ccacaatctc	tgctcctggg	gttcaagcaa	ttctcctgcc	tcagcctcct	89400
gagtagctgg	gattacaggc	acatgccaca	acgcccgtgt	aagttttgta	tttttagtag	89460
agacagggtt	ttgccatgtt	ggccaggctg	gtctcgaaat	cctgacctca	ggtgagctgc	89520
ttcccaaaag	gctgggatta	gaggcgtgag	ccaatgctcc	tggctgaaaa	aaatgcacat	89580
aattttgtac	ctagcaat	catgtctaga	ggcttatcct	agagaaat	ttgcttat	89640
gcataggaag	acgtgtacta	gaatgttcac	tagttgaatg	tttaagtga	aattaggaaa	89700
taaaagtaaat	gttcattaac	aggaaaaatg	gtaaaaggat	atttataaaa	caattaaagta	89760
gctaaaaatga	ataaactaga	gctgcgtgaa	tgaactagaa	ctggttcaat	agtcatgtca	89820
gattattgaa	tgaatacagg	tcagatatgt	atagagtgtc	atttgtgtaa	ttaat	89880
tttttttttt	gagatggagt	ctcactctgt	tgcccaggct	ggagtgcagt	ggcggtgatc	89940
cagctcactg	caacctccac	ctcctgggtt	aaagtgtatc	tcctgcctca	gcctcccag	90000
tagttgggat	tacaggcatg	caccaccatg	cccagctcat	tttccctatt	ttagtggcca	90060
cagggtttca	ccatggtggc	caggctggct	ttgaactcct	gacctcaagt	gttccaccca	90120
acttggcctc	ccaaagtgtc	aggattacag	gcgtgagcca	ccgtgctcag	ccatttgcgt	90180
gatttttaaa	gatgtgcaga	ataatgccat	taaaaaaaat	acacatacat	gtatatatat	90240
acacgtttgg	ctgggtgtgg	tggtcacac	ctgtaatccc	agcactttgg	gaggctgagg	90300
caggaggatc	acttgagccc	agggtgtacaa	gactagcctg	ggcgagatag	caagacccca	90360
tctcaacaac	agaaaggata	attaggtatg	gtggcatgag	aggatcactt	gagcccagga	90420
gttcgagtgt	tatcaggcca	ctgcactcta	gcctggacaa	caaagcaaga	ccgtgtctca	90480
aaaaaataaa	aataaaaaagt	atttgtatgt	ggtcatagtc	aaaaaacgta	catggaagga	90540
aaatgtcttt	atttattttat	ttattttttt	ttttttaaga	cagagtcttg	ctctgtcacc	90600
caggctgggg	tacagtgggtg	taatctcagc	tcaccgcaat	ctcgccctcc	cgggttcaag	90660
cgattcttct	gcctcagcct	tctaagtagc	tgggactaca	ggtaccgcgc	accacaccct	90720
gctaattctt	gtgttttcag	tagagacagg	gtttcaccat	gttggaagg	ctgggtctcg	90780
actcctgacc	ttaagtgagc	caccgcctt	ggcctcccaa	agtccctggga	ttacaggtgt	90840
gagccactgc	gcttggccag	gaaatatcta	atttagtaag	tatttatatc	tgggaaagga	90900
agggtcaggt	ggtgattcat	aggaaactcta	aagtctatgt	ataatactta	gggggacaga	90960
aggaataaaa	gcaaaatgct	gatatattgat	tgtatagtgt	tgtatagtgt	agaagtataa	91020
cataggagat	ctgattgata	gtaggagaat	gttttttaggt	ggtaaaagtg	gaaccgtggt	91080
ggtttgtttt	ggcagtagaa	tcagttgggtc	atagttttgta	tgtggaagggt	aataaacaga	91140
ccatgtttaag	ggaattttgg	tctgagtgtg	gggtggatga	gggtggatga	cagtgtcatt	91200
catgagggaa	gatgaagact	gaggttaggaa	caggtttggg	agaagatgac	atgttccctt	91260
ttagacaagt	ggaatttatgg	aagatggcag	gtaggtgggt	agctatatga	atttgagata	91320
aaagatttag	gtaggagata	ttaatttagg	agtaaacagc	tatctatggt	attgtaagcc	91380
ttaagaatgg	gtaggatcag	ccaggaaata	cagatgtata	tgcaagaagag	aggagtcaag	91440
gaagccaaga	caagttaatg	tttaaagtga	gtgatgtagt	ccatgggcag	atgctgctga	91500

87/122

gagggtcgca	aacaccagtg	accctacaac	attttttaaat	gtcgtcttcc	tgacagcagt	91560
gatcagtgacc	tgcaacgatac	ttatttat	ttttcatggt	agtctccaca	cacttgaatg	91620
tagacttttt	gaaggcaaaa	tcattgcctt	ttctgagctg	ggagcatgtc	tggcacatac	91680
caagcactca	acagttgatg	tattgacttc	atccagatac	tctgagggcg	agttatttcc	91740
tgctactagc	ctttcacctt	tcaatgttta	agagcacaaa	tacagagatg	ggcacgtttt	91800
ggcatttctt	attttgataa	ccttttcctg	gtaagatttt	ttaatgttga	aaaaaaaaaa	91860
caagaaaaga	gggttaaaaa	tagtcttatg	tcagatcctg	tgatagaatt	cacacttggc	91920
ttaagctgct	gggcaccttc	ctatcttggg	tgatcatatta	gcttatctac	agcagaattt	91980
ttactgtttt	atgtagtaag	gaagcaatta	tatgattatt	ttacagacaa	attattcttt	92040
atcttttatt	tttttagacg	gagtctctct	ttgtctccca	ggctggagta	cagtgtcgcg	92100
atctcggtc	actgcaacct	ccgcctcctg	gggtcaagca	attctctgcc	tcagcctccc	92160
aagtagctgg	gcttacaggt	gtccgccacc	acaccagct	cattgttttg	tatttttagt	92220
agagatgggg	tttcaccatg	ttggccaggc	tggtcttgag	ctactgacct	caggtgatcc	92280
accgccttg	gcattcccaa	gtgctggaat	tacaggcggt	agccaccgtg	cctggcccag	92340
acaaattatt	atactctgag	tgtagaggc	ttaggatgtt	ttcacttgat	gctatgggag	92400
gaataagtaa	taagatatga	tacacaacca	aagacctttc	ttcactatgc	ttctagtagc	92460
tagtactatg	gatgacacat	ggtaataata	ttggttagca	tttgtcctca	atttactgtg	92520
ctagtacttc	ttctaagccc	cttacaggta	tatatttttt	ttcatcaata	atcctctaag	92580
gtagttttta	ttattgacct	aattttataa	atcaagaaaa	ttaagaccca	gagaagtaag	92640
taacttgtcc	aagatcacat	ggcttataag	tggttagagcc	agaatttgac	cccagatgtt	92700
gtgactacat	tgctctcca	taagcagggt	caactctttt	gactggatgc	tggtccaagg	92760
tcacttcctt	agagaagcct	ttgctgacaa	ctaccctcct	gtgccctcct	ccaaggctgt	92820
ccattgttct	agaactttga	atactcatct	tagaataaag	ctgggtcta	ttttacagt	92880
ttatagaatg	gatctctgac	tgcaaaagt	ggtcataatt	atctttttat	gttctagtga	92940
aaggcaaaaga	acaagagaag	acctcagatg	tgaagtcct	ttaaaggtaag	ttctgccctt	93000
ggcagtcacc	tgcatataaa	agtgtatgtg	tttgcatattg	tgagttcttt	aatcctgtta	93060
tactctctct	tttggcatta	atcatttctg	ccttattttta	taattactta	tgattttgat	93120
ttattttccct	cttttaacctg	tataatgtct	taacatctag	catataataa	gtaggctttt	93180
tttttttttt	tttttttgga	gacggagtct	tgctctgtta	cccaggctgg	agtgcagtgg	93240
cgcgatcttg	gctcactgca	agctctgtct	cccgggttca	caccattctc	ctgcctcagc	93300
ctccccagca	gctgggacta	caggtgcacg	gcgccacgcc	tggtcaattt	tttgtatttt	93360
ttagtagaga	cagagtttca	ccatgttagc	cagtatgggt	tcgatctcct	gaccttgta	93420
tcgcgccgcc	tcggcctccc	aaagtgtctg	gattacaagc	gtgagccacc	gcacccggcc	93480
gtaagtaggc	tttttttacc	ttaattttat	ttttttgaga	tgtagtcttg	ctcttatccc	93540
caggctggag	tgtagtgggt	ccatctcggc	tcactgcagc	atccacctcc	cgggttcaag	93600
cgattctctc	gcctcagcct	cccgagtagc	gggattaca	ggtggccgcc	accatgcccc	93660
gctaattttt	gtatttttag	tagagacagg	gtttcacctg	gttggccagg	ccagtctcaa	93720
actcctgacc	tcaagtgtac	cactgcctct	ggcctcccaa	agtcctggga	ttacaggcgt	93780
gagccaccat	gcctggccat	aagtaggctt	ttactgagcc	ttgtgtgtat	tggctatcct	93840
agtgattaca	gtgaaccagt	gcccttctta	ttaatcacac	atttaattgt	tccctaaaag	93900
tgattagtct	actttattta	tttagtaaga	caaaaaatga	agaatactct	taactgagca	93960
gtctgttaac	tgtaggaag	cactgacact	tataaggctt	agttttctgt	catttatcca	94020
gaagtatggt	tgattacagt	ttttactttt	ttatttgaat	gaacaacctt	aatttaaaat	94080
atattttgtt	tattttttgt	tggtatcgat	acattgtcct	tgtttataga	ttagagcatg	94140
cttttttaaag	atgctgtatt	actcactgat	tttatttgtc	cagtgtacag	agattgaagt	94200
gggaaaatta	taattggaaat	tgtttccata	gtcattacat	attaatttca	tcaattttat	94260
tccataaaaat	ctgtagattg	ctacttat	agatttttcc	ttcaaatgtt	tttatgttgt	94320
attgtctgca	ctgagtattt	attctatatg	ctcaatttgc	tggagaagaa	gactaattat	94380
aacttaggca	agttgtaaaa	ttagggaaaa	aagttaaggta	ccttacagcc	tagtttactt	94440
atttcttatg	taaagccagt	tagattccac	attagttcaa	actgccttct	ttgagcaaaa	94500
ctttgtggc	agtataaag	gcttaaagcc	cttctcaagc	agagacctgt	aaagactaga	94560
tctgactgta	gtagaaggaa	ggaacttaga	tgtttcaggc	agtgagaaca	ccagtcttcc	94620
actctaaact	ttgccactaa	cagtatgacc	ttgggaagt	gtaactttct	tcagattctt	94680
catttgttga	atggggggat	tgccctagct	aatctctaaa	tctctactgg	gctaaaaaat	94740
tctgtgctta	tactctgatt	atgaagtaca	taactctgtc	ttaacattca	ctgactttatc	94800
cttaggataa	tacagaagca	gtacaagaaa	cagccctca	agatgtttgc	agctgtggtta	94860
gaaagacaaa	cttatacaca	gaacagtagc	aaatagacca	aaataataat	agctgccatt	94920
tatagaacac	ttcttctgtt	ctgggcatta	gacaaaaact	gactataacg	gtgaacaaaa	94980
aagacttagg	tcctgccttc	attgaactta	cagatttagta	ggggagagga	acattaatca	95040
agtaattcca	cagatggctt	agcctagatt	ggtagtgtatg	gaagtaaaaga	gatgtgaacg	95100

88/122

gacttgaaaa	aaaattcggg	ggcaaaatgg	atagaagttt	attattgatt	aaatatgagg	951
tgtgagagag	agggatattt	aagattgata	cctaccttct	ggcttgcccta	acagaaccac	952
aacaggaaat	tatatgttca	gttttgttat	gttgggtggg	aggtgctttt	gagtcattca	952
tttatatatg	ttatatatgt	tattttatat	gcatagtaat	tttaaggctt	gagttttaaa	953
ccaaagggtta	gagagtgatt	tttttagatc	tagcaaacct	aagttgaaat	cctgcctggt	954
gaaatggctg	tttactagct	cattaacctt	gggcaaatga	ttcaacttgt	tttcatTTTT	954
gtcttcatct	ctaaaatgag	gaaaatatgg	tcttacaaga	ttgtcctgag	agatagatga	955
aataatatcc	aaaaaaaaaa	aaggtacata	gagaaactcg	tatagtgcct	ggtatatagt	955
aggtcctcca	ttggtagcta	tcattatcta	gttttaacat	agccttcagt	ttgttgaatt	956
agtcaaaactg	agtgaagcac	tgcaagggaat	tcagagggaat	ttgagatcaa	caaatgattt	957
ctgaagttta	gggaagactt	catggcaatg	acacttacct	tgtataaaaag	ttgaagaata	957
agaaagattt	ggaatgagaga	ttctttctct	tctccctacc	agcccagctt	cttatttgag	958
gatataattgg	gcaaaaggggc	cttcagacaa	gtagagggag	attttttacag	aaagattgag	958
atgaaggtat	agaaggctgt	aaagaccaga	aaagagaatt	gagacagagg	aaagcaggaa	959
ccactgtagg	tttttgagca	agatattgat	gctgtaagta	tggtgtttat	gaaaggttag	960
tctggaagag	atttgcagga	tgagagcccc	ggaagttttt	ttgttataat	acagaaagac	960
ttgcactgag	ggtgaggtgt	taaaaataaa	caggttaagta	aatgttttaa	catcttgaag	961
gaaaagtcaa	caaatcttgg	caagtaaaaca	gataacagtg	aaaaagaatg	ggaccaagat	961
tttgagtttt	ggagactggg	ggattgaaca	gacagggaaa	ttgagaggag	aatcagatga	962
tgatgtttta	agttgatatt	tagacagatt	gtgcttgaga	tggtaaaagtc	aatgtgggtg	963
ggaatgctta	gtagcgagta	atcagtgata	caagacccaa	gcccaggtca	aagacaagtc	963
acagatacag	atcagggcct	tttcatctgc	tccacagagg	tgtaccctag	gagctgttgc	964
aaacagttcca	tgtggagggg	gtgagtaaga	tggtttccct	gaatttgcca	gaattacttt	964
tttgttgttg	ttgttgtttt	ttctgagaca	gattctcgct	ctgttgccca	ggctggaggg	965
cagtggcgag	atcgcgagc	tcactgcaac	ctctgcctct	cgggttcgag	tgattctcct	966
gcctcagcct	cccaagtagc	tgaggattaca	ggcttgtgcc	accaagccca	gctaatttct	966
tttgtatttt	tagtagagat	gggggtttcac	catgttgccc	agactggtct	cgaactcctg	967
gcctcgtgat	ctgcctgcct	cagcctccaa	aagttctggg	attacaggcg	tgaaccactg	967
cacccggtcc	cttgttaagt	ttattttggg	gggaagcaaa	ggaggtttca	gcttttaaaa	968
agtttgaaaa	ttattgtctc	ggtaataaatt	aaagatttga	gagtaaatat	gctttctagc	969
agaaagaata	aaagaagaac	agatagcctc	aaagaaggga	gccaaagaag	caggtctatat	969
ctgacacact	gggtgttgat	aaatgggtat	taaaagaatg	agagcaatga	gcagatagaa	970
gaggaaattta	ggagagtata	ataccatgga	gaccaagaaa	gatagactat	caggaaggag	970
tggttaaaat	aagttactag	ttctaagaga	gatgttaaga	gggaccgggg	aaagccttgt	971
acaaatgagt	tagtagcatt	ttacattata	tacatctaatt	taagaaacaa	tgcgagagtc	972
tcaccattcc	tatagactct	tacttgtact	tgtctgaaca	cgaaaactgg	cttttgttta	972
taaaataagct	aaaaattatt	ttctcatgaa	ttctcatgaa	aataaaaaata	aaccttcttt	973
taacattgaa	aaaatagttt	gaagacagtc	actcttcatt	ttgtaattcc	cacaactatt	973
attgaatgac	tgaattatct	tttattctga	agccaaaggg	gtgatactga	tatttcttca	974
gactactaaa	aatatatttt	atgaattttt	agtgtgcttt	atcttttttt	gttttttttt	975
ttgagatgga	gttttactcc	cgttgctcag	gctggagggc	agtggtgcaa	tctcagctca	975
ctgcaacctt	cgctcccag	attcaagcaa	ttctcctgcc	tgggtctccc	aagtagctgg	976
gattacaggc	acctgcccc	acaccagct	aattttttgt	attttttagta	gagacagggt	976
ttcaccatgt	tggtcaggct	ggtcctgaac	tcctgacctc	aggtgatcca	cccaccttgg	977
cctcccaaag	tactgcgatt	gcaggcatga	gccaccatgc	ctggcctgag	gaatattttt	978
ctagggtccc	cccaccccaa	gcattttatc	tgcaatttta	gttttgttcc	taaagcaagc	978
aagggttaag	gatttataaa	taatccgtat	tttagaatgc	tttctggctt	tgttactttt	979
tatccacagt	agaagttctc	agagaatgat	ctccctcttt	taatttaact	ttttggcaca	979
gtattttgag	aattataaat	aatattagaa	tgttttctgg	ctgggtgtgg	tggctcatgc	980
ctgtaatcct	ggctacttgg	gaggctgagg	caggagaatc	acttgaacat	gggaggcaga	981
gggtgcagtg	agccgaggtc	atgccactgc	actccagcct	gggtgacaga	gcaagactct	981
gtctgggaaa	aaaaaaaaaa	aaaaaaagag	tgttttcttt	cctattttcc	accacttgat	982
taagttactt	ttcctcttaa	gtattttttg	ctgagtatgc	tgacttaaga	gtaatgttac	982
aaaatttaatt	ttttaaagtt	ctctgaaagc	ccctttatga	gagttttagg	ctatcaaat	983
gtgtttaatt	cttaacaatt	ttttgaaaaa	ttatagcttc	aatatccgta	cattccccac	984
aaaaaaagcac	taaaaatcat	gccttgctgg	aggctgcagg	accaagtcac	gttgcaatca	984
atggcaatttc	tgccaacatg	gactcctttt	caagtagcag	gacagccaca	cttaagaagc	985
agccaaagcca	catggaggcc	gctcattttg	gtgacctggg	taagtaacta	tcatttttta	985
ttaaacttgta	ttagaaggat	ttgagtacaa	tatgtgaaac	ttctgtcata	ggatcacagaa	986
ctatataaatt	ggaaagtgcct	ttggaaaaaa	tgtattttaa	ataacagcta	caagtataat	987

87/122

gagggctgca	aacaccagtg	accctacaac	atthtttaaat	gtcgtcttcc	tgacagcagt	91560
gatcagtagc	tgcaacgatc	ttattttattt	ttttcatggt	agtctccaca	cacttgaaatg	91620
tagacttttt	gaaggcaaaa	tcattgcctt	ttctgagctg	ggagcatgtc	tggcacatac	91680
caagcactca	acagttgatg	tattgacttc	atccagatac	tctgagggcg	agttatttcc	91740
tgctactagc	ctttcacctt	tcaatgttta	agagcacaaa	tacagagatg	ggcacgtttt	91800
ggcattttct	atthttgataa	ccttttcctg	gtaagatttt	ttaatgttga	aaaaaaaaaa	91860
caagaaaaa	gggttaaaaa	tagtcttatg	tcagatcctg	tgatagaatt	cacacttggc	91920
ttagctgct	gggcaccttc	ctatcttgga	tgcatatata	gcttatctac	agcagaattt	91980
ttactgtttt	atgtagtaag	gaagcaatta	tatgattatt	ttacagacaa	attattcttt	92040
atctttttatt	tttttagacg	gagtcctctt	ttgtctccca	ggctggagta	cagtgtcgcg	92100
atctcggtc	actgcaacct	ccgectcctg	ggttcaagca	attctctgcc	tcagcctccc	92160
aagtagctgg	gcttacagg	gtccgccacc	acaccagct	cattgttttg	tatttttagt	92220
agagtagggg	tttcaccatg	ttggccaggc	tggtcttgag	ctactgacct	cagggtgatcc	92280
accgccttg	gcatcccaaa	gtgctggaat	tacaggcgtg	agccaccgtg	cctggcccgag	92340
acaaattatt	atactctgag	tgtagaggc	ttcacttgat	ttcacttgat	gctatgggag	92400
gaataagtaa	taagatatga	tacacaacca	aagaccttcc	ttcactatgc	ttctagtagc	92460
tagtactatg	gatgacacat	ggtaataata	ttggtagca	tttgtcctca	atttactgtg	92520
ctagttactc	cttacaggta	tatatthttt	tatatttttt	ttcatcaata	atcctctaag	92580
gtagttttta	ttattgacct	aattttataa	atcaagaaaa	ttaagacca	gagaagtaag	92640
taacttgtcc	aagatcacat	ggcttataag	tggtagagcc	agaatttgac	cccagatgtt	92700
gtgactacat	tgtctctcca	taagcagggt	caactctttt	gactggatgc	tggtccaagg	92760
tcacttctct	agagaagcct	ttgtcgacaa	ctaccctcct	gtgccctcct	ccaaggctgt	92820
ccattgttct	agaactttga	atactcatct	tagaataaag	ctgggtcta	ttttacagtg	92880
ttatagaatg	gatctctgac	tgcaaaagtt	ggtcataatt	atctttttat	gttctagtga	92940
aaggcaaaag	acaagagaag	acctcagatg	tgaagtccat	taaaggtta	ttctgccctt	93000
ggcagtcac	tgcatataaa	agtgatgtgc	tttgcattht	tgagttcttt	aatcctgtta	93060
tactctctct	tttggcatta	atcatttctg	ccttatttta	taattactta	tgattttgta	93120
ttatttccct	ctttaacctg	tataatgctt	taacatctag	catataataa	gtaggctttt	93180
tttttttttt	tttttttgga	gacggagctt	tgctctgtta	cccaggctgg	agtgagctgg	93240
cgcgatcttg	gctcactgca	agctctgtct	cccgggttca	caccattctc	ctgcctcagc	93300
ctccccagca	gctgggacta	cagggtgcacg	gcgccacgcc	tggttaattt	tttgtatttt	93360
ttagtagaga	cagagtttca	ccatgttagc	cagtatggtc	tcgatctcct	gaccttgtga	93420
tcgccccgcc	tcggcctccc	aaagtgcctg	gattacaagc	gtgagccacc	gcaccggcc	93480
gtaagtggc	tttttttacc	ttatthttat	ttttttgaga	tgaggtcttg	ctcttatccc	93540
caggctggag	tgcatgggtg	ccatctcgcc	tcactgcagc	atccacctcc	cgggttcaag	93600
cgattctcct	gcctcagcct	cccgagtagc	tggtattaca	gggtggccgc	accatgccca	93660
gctaattttt	gtatttttag	tagagacagg	gtttcacctg	gttgccagg	ccagtctcaa	93720
actcctgacc	tcaagtgatc	cactcgccct	ggcctcccaa	agtcctggga	ttacaggcgt	93780
gagccaccat	gcctggccat	aagttaggct	ttactgagcc	ttgtgtgtat	tggtatacct	93840
agtgtattaca	gtgaaccagt	gccttcttta	ttatcacac	atttaattgt	tcctataaag	93900
tgattagtcc	actttattta	tttagtaaga	caaaaaatga	agaatactct	taactgagca	93960
gtctgttaac	tgtaggaaag	cactgacact	tataaggctt	agttttctgt	catttatcca	94020
gaagtatgg	tgattacagt	ttttactttt	ttatttgaat	gaacaacctt	aatttaaaat	94080
atattttgtt	tattttttgt	tggtatcgat	acattgtcct	tggttataga	ttagagcatg	94140
cttttttaaag	atgctgtatt	actcactgat	tttatttgtc	cagtgtacag	agattgaagt	94200
gggaaaatta	taatggaaat	tgthttccata	gtcattacat	attaatttca	tcaatttatt	94260
tcataaaaa	ctgtagattg	ctacttattt	agatttttcc	ttcaaatgtt	tttatgttgt	94320
attgcttgca	ctgagtattt	attctatatg	ctcaatttgc	tggaagaaga	gactaattat	94380
aacttaggca	agttgtaaaa	ttagggaaaa	aagtaaggta	ccttacagcc	tagtttactt	94440
atttcttatg	taaagccagt	tagattccac	attagtcca	actgccttct	ttgagcaaaa	94500
cttgattggc	agtataaaag	gcttaaaagc	cttctcaagc	agagacctgt	aaagactaga	94560
tctgactgta	gtagaaggaa	ggaacttaga	tgthttcaggc	agtgaaga	ccagtcttcc	94620
actctaaact	ttggccactaa	cagtatgacc	ttgggaagtt	gtaactttct	tcagattctt	94680
cattttgtga	atggggggat	tggtctagct	aattttctaaa	tctctactgg	gctaaaaaat	94740
tctgtgctta	tactctgatt	atgaagtaca	taatctgtgc	ttaacattca	ctgacttatc	94800
cttaggataa	tacagaagca	gtacaagaaa	cagccctcca	agatgtttgc	agtcctggta	94860
gaagagacaaa	cttatacaca	gaacagttagc	aaatagacca	aaataataat	agctgcatt	94920
tatagaacac	ttcttctgtt	ctgggcattta	gacaaaaact	gactataacg	gtgaacaaaa	94980
aagacttagg	tcctgccttc	attgaactta	cagattagta	ggggagagga	acattaatca	95040
agtaattcca	cagatggctt	agcctagatt	ggtagttagt	gaagtaaaaga	gatgtgaacg	95100

88/122

gacttgaaaa	aaaattcggga	ggcaaaatgg	atagaagttt	attattgatt	aaatatgagg	95160
tgtgagagag	agggatattt	aagattgata	cctaccttct	ggcttgccct	acagaaccaa	95220
aacaggaaat	tatatgttca	gttttggtaa	gttgggtggg	aggtgctttt	gagtcattca	95280
tttatatatg	ttatatatgt	tattttatat	gcatagtaat	tttaaggtct	gagttttaaa	95340
ccaaagggtta	gagagtgaat	tttttagagtc	tagcaaacct	aagttgaaat	cctgcctgtt	95400
gaaatggctg	tttactagct	cattaaccta	gggcaaaagta	ttcaacttgt	tttcattttt	95460
gtcttcatct	ctaaaatgag	gaaaatatgg	tcttacaaga	ttgtcctgag	agatagatga	95520
aataatatcc	aaaaaaaaaa	aaggtacata	gagaaactcg	tatagtgcct	ggtatatagt	95580
aggtccctcca	ttggtagcta	tcattatcta	gttttaacat	agccttcagt	ttgttgaatt	95640
agtcaaaactg	agtgaagcac	tgcaagggaat	tcagaggaat	ttgagatcaa	caaatgattt	95700
ctgaagttta	gggaagactt	catgggcaatg	acacttacct	tgtataaaaag	ttgaagaata	95760
agaaagatttt	gaatgagaga	ttctttctct	tctccctacc	agcccagctt	cttatttgag	95820
gatataattgg	gcaaaaggggc	cttcagacaa	gtagagggag	attttttacag	aaagattgag	95880
atgaaggtat	agaaggtctg	aaagaccaga	aaagagaatt	gagacagagg	aagcaggaag	95940
ccactgtagg	tttttagagca	agatattgat	cggtgaagta	tggtgtttat	gaaaggttag	96000
tctggaagag	atttgcagga	tgagagcccc	ggaagttttt	ttgttataat	acagaaagac	96060
ttgcactgag	gggtgaggtg	taaaaataaa	caggtaagta	aatgtttaaa	catcttgaag	96120
gaaaagtcaa	caaatcttgg	caagtaaaca	gataacagtg	aaaaagaatg	ggaccaagat	96180
tttgagtttt	ggagactggg	ggattgaaca	gacagggaaa	ttgagaggag	aatcagatga	96240
tgatgtttta	agttagatatt	tagacagatt	gtgcttgaga	tggtaaaagtc	aatgtgggtg	96300
ggaatgctta	tagtcgagta	atcagtgata	caagaccaaa	gcccaggtca	aagacaagtc	96360
acagatacag	atcagggtctt	tttcatctgc	tccacagagg	tgtaccctag	gagctgttgc	96420
aaacagtcca	tgtggagggt	gtgagtaaga	tgtttccctt	gaatttgcca	gaattacttt	96480
ttgttggttg	ttgttggttt	ttctgagaca	gatttctcgt	ctgttgccca	ggctggaggg	96540
cagtggcgag	atcgcgagc	tcactgcaac	ctctgcctct	cgggttcgag	tgattctcct	96600
gcctcagcct	cccaagtagc	tgggattaca	ggcttggccc	accaagccca	gctaatttct	96660
tttgtatttt	tagtagagat	ggggtttcac	catgttggcc	agactggtct	cgaactcctg	96720
gcctcgtgat	ctgcctgcct	cagcctccaa	aagttctggg	attacaggcg	tgaaccactg	96780
cacccggtcc	cttgtttaagt	ttattttggt	gggaagcaaa	ggagggttca	gcttttaaaa	96840
agtttgaaaa	tatttgcctt	ggtaataaatt	aaagatttga	gagtaaatat	gctttctagc	96900
agaaagaata	aaagaagaac	agatagcctc	aagaagggga	gccaaagaag	caggctatat	96960
ctgacacact	gggtgttgat	aaatgggtat	taaaagaatg	agagcaatga	gcagatagaa	97020
gaggaataa	ggagagtata	ataccatgga	gaccaagaaa	gatagactat	caggaaggag	97080
tggtaaaaat	aagttactag	ttctaagaga	gatgttaaga	gggaccgggg	aaagccttgt	97140
acaaatgagt	tagtagcatt	ttacattata	tacattcta	taagaaacaa	tgcgagagtc	97200
tcaccattcc	tactagactc	tacttgtact	tgtctgaaca	cgaaaactgg	cttttgttta	97260
taataaagct	aaaaattatt	ttgctccaat	ttctcatgaa	aataaaaaata	aaccttcttt	97320
taacattgaa	aaaatagttt	gaagacagtc	actcttcaat	ttgtaattcc	cacaactatt	97380
attgaatgac	tgaattatc	tttattctga	agccaaaggg	gtgatactga	tatttcttca	97440
gactactaaa	aatatatttt	atgaattttt	agtggtcctt	atcttttttt	gttttttttt	97500
ttgagatgga	gtttcactcc	cggtgtcag	gctggagggc	agtggtgcaa	tctcagctca	97560
ctgcaacctt	cgctcccag	attcaagcaa	ttctcctgcc	tcgggtctccc	aagtagctgg	97620
gattacaggc	acctgcccc	acacccagct	aattttttgt	atttttagta	gagacagggt	97680
ttcaccatgt	tggtcaggct	ggtcttgaac	tccctgacct	aggtgatcca	cccaccttgg	97740
cctcccaaa	tactgcgatt	gcaggcatga	gccaccatgc	ctggcctgag	gaatatattt	97800
ctagggtccc	cccaccccaa	gcatttatcc	tgcaatttta	gttttgttcc	taaagcaagc	97860
aagggttaag	gatttataaa	taatccgtat	tttagaatgc	ttcttggtct	tgttactttt	97920
tatccacagt	agaagttctc	agagaatgat	ctccctcttt	taatttaact	ttttggcaca	97980
gtattttgag	aattataaat	aatattagaa	tgttttctgg	ctgggtgtgg	tggtcatgac	98040
ctgtaatcct	ggctcacttg	gaggtgagg	caggagaatc	acttgaacat	gggaggcaga	98100
gggtgcagtg	agccgaggtc	atgccactgc	actccagcct	gggtgacaga	gcaagactct	98160
gtctgggaaa	aaaaaaaaaa	aaaaaaagag	tgttttcttt	cctattttcc	accacttgat	98220
taagttaact	ttcctcttaa	gtattttttg	ctgagtatgc	tgacttaaga	gtaatgttac	98280
aaaatttaatt	ctctgaaagc	ccctttatga	gagttttagg	aatatccgta	ctatcaaat	98340
gtgttttaatt	cttaacaatt	ttttgaaaaa	ttatagcttc	acaaagtcac	cattccccac	98400
aaaaaagcac	taaaatcat	gccttgctgg	aggctgcagg	gacagccaca	gttgcaatca	98460
atgccatttc	tgccaacatg	gactccttt	caagtagcag	taagtaacta	cttaagaagc	98520
agccaagcca	catggaggcc	gctcattttg	gtgacctggg	ttctgtcata	tgatacagaa	98580
ttactttgta	ttagaaggat	ttgagtacaa	tatgtgaaac	ataacagcta	caagtataat	98640
ctataaatt	ggaaagtgc	ttggaaaaaa	tgtattttaa			98700

89/122

gggtagctgt	ggtgtgttcc	tgtaaatata	gaatataaag	catgcccagt	agaaaaacaa	98760
gcatttccag	aagaaatata	tctgacact	aaatataaat	atatgaaaaa	gatgtctcac	98820
tttattactg	aggggaagtgc	aaattaaaaat	aatcagttaa	tggtctccta	acacattagc	98880
atatttttta	aagtttgaca	atttgaatgt	cagtgaagat	gcagggaagt	acccctccta	98940
tttagtgata	atataatctg	gtgaagactc	tttggaagc	aatttggaat	tcagtataaa	99000
atatgcatgt	catttaggcc	actctttcta	agacctagcc	ctcagatatg	ctcattcata	99060
tgtgcagggtg	tgtatgtgtg	tgtgtgtgtg	tgtgtgtgtg	tgtatatgta	tgtatgtatg	99120
tatgtatgta	tgtatgttga	aggctattca	ttatagtatt	gtttgtgata	gcaaaaaatt	99180
atggacaaca	tataaatatc	tgttataggg	aaataaccaa	atttgtggtat	acgcatgctc	99240
tgaggtataa	tatagccatt	tgtttctatt	tatttatttt	cttgagacag	ggttttactc	99300
tggtgcccag	gctggagtg	agtggatga	tcattggtca	ctgcagcctt	cacctcctgg	99360
gcacaagcca	ttctctcgcc	tcagcctcca	gagttactag	gactgcaggc	atgtgtcacc	99420
acaccagat	aattttttta	ttttttgtag	agacagggtc	tcactatggt	gcctaagctg	99480
gtctcaaaact	cttggcctca	agcaattctc	ccacacaggc	ctcccaaagt	gctgggatta	99540
ccaacgtgaa	ccaccacacc	tggttcagtg	tagccattta	gaaatctaaa	aaagacgtgg	99600
gaaaaatgtct	aaggcatggt	taaattgtgag	aaaagcaagt	cacagtatgc	atggtaaaat	99660
ccgttatatt	aaaaaagtt	cttccaaaac	aaaaacatat	gcaggagacc	tttattttgt	99720
cagtatttct	taccctaaat	tctgcactta	gaaaaatgca	tgtcatgttg	tcataagttg	99780
aaaaaaagat	ccatgaacca	atggacttct	aataaaatca	gtcctgcttt	tgacatctct	99840
ctctactttt	gtgtatatct	aaaccagagt	gtcaatgtgt	ttgtggggca	cacttagcaa	99900
taatacatag	cagacaaaaat	gcataatagct	cagagagtaa	aattgtaagt	tttgctagat	99960
cactcataaa	ttgctgatga	gaatttataa	tggtgcagat	gctctggaaa	acaggcagtt	100020
tctttctttc	tttttttttt	tctttttgag	acaggggtctc	actctgttgc	gcaggctgga	100080
gtacagtggtc	gtgattacaa	ctcactgcag	cctcacccctc	ctcagggtca	ggtgatccctc	100140
cctcagttctc	ctgagtagct	gggactatag	gcacgcacca	ccacgcctgg	ctaattttttg	100200
tatttttttt	tttttttttt	gtagagacgg	ggtttcgcca	tggttcccag	gctgggtctca	100260
aactcctgga	atcaagcgat	ccacttgctg	aggcctccca	aagtgcctggg	attacgggag	100320
tgagctactg	tgctctggcct	aggcagtttg	tttgtttgtt	tggttgggtt	tttatttttt	100380
tgtagacgga	gtctcacagg	ctggagtgc	gtggcccaat	ttttggctca	ctgcaacctc	100440
cgctcccgag	gttcaagcta	ttctcctgcc	tcagcctcct	gagtagctgg	gatgacaggt	100500
gcctgcata	atgcctggct	gattttttgt	tatttagtag	atatgggggt	tcacatgttt	100560
ggctcaggctg	gttttgaaact	cctgacctca	gggtgatcagc	ccgcctcggc	ctcccaaagt	100620
gctgggatta	caggcatgag	ccgtcatccc	tggtgggtgg	tttcttatga	cgtgaaacat	100680
gcaattacca	tatgacctag	cagttgcact	ctgtatttat	cccagataaa	tgaaaactta	100740
ccttccaata	aaaacctgtg	cacaaatggt	catagcagct	taatattgaa	aaactggatg	100800
ttcttcagca	ggtgaatgaa	ctggttcatt	cataccatgg	aataaccattc	agcaataaaa	100860
aggaacaaac	tgttgataca	tttaaccacc	tggtatgaata	tcaagggaat	tatgctgtca	100920
gacaaaaacc	agtcctctaa	gactacatat	agtatgattc	cggttgata	atattcttga	100980
aatagagaaa	tttaagagaaa	tgaaaagatt	agtgtttgcc	agatgttaga	gacagggagg	101040
tgagaggggt	aagtgggtgt	agttataaaa	gtgcaacatg	agggatcttt	gtgatgttga	101100
agttgtatct	tgccagtgga	tgcaaaaatc	tcaatgtgat	aaaattacaa	agaactaaaa	101160
acaagaatga	gtatagataa	aactggggaa	atctgaacaa	gttagagtgt	tgtatcactg	101220
tcagtatctt	agagtgtat	tgtactatag	ctttgcaaga	tgttaccatg	ggagaaacta	101280
aagtgtacaa	gggatctcta	ggtattatta	tttttttaga	gatgggggtt	cactatgttc	101340
cccaggccgg	tcttgaaactc	ctgggctcta	gtgatccgcc	tgccccagcc	tcctaaagta	101400
ctggaattac	aggcgtgagc	gaccatgcct	ggccttttca	gtattgtatc	ttagaacttc	101460
atgtgaatct	agcattatct	catagaattt	aattaaaaga	aattgtaaac	ctcacagaag	101520
atcagaattt	cctcaagttt	gtgatgttga	caaagatgaa	ctagttgaca	ctgacagtaa	101580
gactgaggat	gaagacacga	cgtgcttcaa	aaaaatgatt	tgaatatcaa	tggaattaaga	101640
agaactcttt	tgacaaaattg	atgaaacct	cagtcagttt	tataagaatg	cccatcttta	101700
tgatcatgct	atgaaagcca	attttttaaa	aaattttttg	tctttcctaa	caattagctt	101760
gtggttataa	tttaaattta	gttaaatata	agataaatga	ttttttatta	agtttagttt	101820
cattttttca	ggtacgatct	caaagctact	cttttaacct	ctatgaatga	ataatgtctga	101880
gttcataaca	tctttgtaga	tatatccaca	ctttccctc	aggataagtg	cctacaagtg	101940
gaattactgg	actgaaaata	atgcagtttg	ctaagacttt	gctatctgtt	cctgaatgct	102000
cctccaaaaa	ggttttgcca	gtttacatcc	tcatgaccag	cgaatgagag	tggtgcctat	102060
tttctgtgct	gcttaaatat	ctttgttact	ttttgaaaaa	aatctaattt	gacagacaaa	102120
aatgcatttt	atgttaattt	gcttttctgg	gatttttaat	gaggttgagt	atagttttta	102180
atatttttat	tggccctttt	ggaactagta	tcataagttt	tttttcttaa	gaatttatgt	102240
agtcgggct	ggcgccagtg	gctcacgcct	gcaatccag	cactttggga	ggccgaggtg	102300

90/122

ggtggattgc	cgaaggtcag	gagtttgaga	ccatcctgac	caacatgggtg	aaaccgaatc	102360
tctactaaaa	gtacaaaaac	tagctcagcg	tggtggcggg	tgctgtaat	cccagctact	102420
taggaggctg	agtcaagaga	atcgcttgaa	cccgaggagt	ggagggtggg	tgcatgtagc	102480
cgagatcgcg	ccattgctct	ccagcctagg	caacaagagt	gaaaagtctc	aaaaaaaaaa	102540
aaaaaaaaaa	aaaaaagaat	ttacatgggtc	tgaattgccca	ttaaaagaga	tatgagaatt	102600
atttgatgtaac	aaataacttt	ttataaattt	aggcaagttt	tggacgattg	tactttgttt	102660
agaaacccaaa	agcatagtat	ttgtagtttt	tttattttact	ttagttgcta	ggaagtaaac	102720
tttatttcag	gtctctggta	ccagtgtgtg	ctaaaagtga	ttgactaatc	tgtcaatctg	102780
aaattattttg	ttgctgaact	gctaattcct	ttgcttctat	cttttaggca	gatcttgtct	102840
ggactaccag	actcaagaga	ccaaatcaag	cctttctaag	acccttgaac	aagtcttgca	102900
cgacactatt	gtcctccctt	acttcattca	attcatggaa	cttcggcgaa	tgagcattt	102960
ggtgaaattt	tggttagagg	ctgaaagtgt	tcattcaaca	acttggtcgc	gaataagagc	103020
acacagtcta	aacacagtga	agcagagctc	actggctgag	cctgtctctc	catctaaaaa	103080
gcatgaaact	acagcgtctt	ttttaactga	ttctcttgat	aagagattgg	aggattctgg	103140
ctcagcacag	gtgtttatga	ctcatcaga	aggaattgac	ctgaataata	gaactaacag	103200
cactcagaat	cacttgctgc	tttcccagga	atgtgacagt	gccattctc	tccgtcttga	103260
aatggccaga	gcaggaactc	accaagtttc	catggaaacc	caagaatctt	cctctacact	103320
tacagttagcc	agtagaata	gtcccgtctc	tccactaaaa	gaattgtcag	gaaaactaat	103380
gaaaagtggag	tatgtgattt	tcttgtgtgt	acatatgtgt	ctcactttct	ttttttaatt	103440
tactaagcag	aacttcagat	gaggaataaa	atgattggaa	tatttttttt	ctcctctaac	103500
tacttgtaaa	tttgggagaa	tttgagagt	gtagtagagt	cagatcagtg	tatggaaaag	103560
gagcaggagt	gactggacct	tctaagaagt	gtgttatcag	aattagtaaa	tgaagggtca	103620
aatgtcctac	ttttccctc	cactgatttt	gacatcaaac	cattatccac	atagccttat	103680
ttcctccctc	ggctttaatt	ttattaatat	tttactgcac	tttgagata	aaatttttaa	103740
aaaattttta	aaaattgcca	ataagtgaac	tttattaagt	tcagtgtcta	gtgtatattt	103800
ggatttttatt	tattagtcaac	aagacctttg	tgcaggtagt	aggcatgatt	atcttttttt	103860
ttttgagatg	gagtcctgct	ctgtcgccca	ggctggagtg	caatggcgcg	gtctcggtct	103920
actgcaacct	ccgggttcat	gccattctcc	tgctcagcc	tcccaaatag	ctgggactac	103980
aggcgctgc	caccacaccc	ggctaatttt	tttgtatttt	tagtagagac	gggttttcac	104040
catgttcgcc	aggatggtct	cgatctcctg	actttgtgat	cgcctgcct	cggcctccca	104100
aagtgtggg	attacaggca	tgagccaccg	cgcccgact	gattatctta	tttacacatg	104160
agaaaaccag	ggcttagaaa	ggtaggtaa	cttctctag	gtgtacagt	aaatgtggac	104220
ctagaagatt	tttgacaaga	gcacctgttt	ttttttctc	tctattagtt	tagaaattat	104280
atactcttaa	ttatcacctg	ggattttgat	tagacagcct	tcatgttctt	tttcatctta	104340
aatgtttctt	gtgtcttaaa	gggctaagt	atctctcag	atcttttagt	tcactcattc	104400
tcagtgaact	aaaatgagg	ctaactgct	actgaatcaa	gttttcagca	tgttattttc	104460
ttcctccctc	cctccctcct	tccttccctc	aaccaggctc	ccgaggagct	gggattacag	104520
gcgcccgcga	ccactcctgg	ctaattttta	tatttttagta	gagacgggg	ttcaccatgt	104580
tggtcaggct	gatcttgaac	tcctgacctc	aagtgaacca	cctgcctcgg	cctcccaaa	104640
tggtgggatt	acaggcatga	atcaccacac	ctgacggcat	gttattttca	tcgcaaagtt	104700
actgtaagct	gggagaagt	gcacacactt	gtactcccag	ctactcagga	agcttaaggt	104760
gagaagattg	cttgagccca	ggagttttga	gaccaacctg	ggcaacacag	caagacccca	104820
gctcaaacaa	agaaaaaaag	ttattgaatt	ttttatttct	atggatcatt	ttttgtagtt	104880
tcttattcct	ttcaccttct	attcccactt	ttgatcccat	cttttattta	tttagtttta	104940
ttaaatgtat	atttgtctga	taattctgct	atctacagt	ttttgtggac	ctgactcagc	105000
atttctttgt	ttcttcggat	tcagactgtt	ggtggcttgt	gatttttagtg	atttttggcc	105060
gtgaacatgt	ttcttggtg	tttgtctgtg	ggaattctct	gtgtactctg	tataaattaa	105120
gttacttcag	gtgttttgca	ttttcttttg	ccatgcacct	ggggcctggg	tcactacctt	105180
tctgggtacca	cttaaaaactg	aatttttgtc	ttgggtgctc	gtactgatcc	tgtatgagta	105240
cagggtttata	cttactgtag	aaatattggg	tttgattatg	gggtattgtc	ccagatgggt	105300
ctgggagtatt	aatatgctct	ctgttaaaact	taatgtgttg	tccctgtaaa	actccaaaat	105360
tctgaattcc	agaatactac	tggccccaaa	tgtttaagat	aagggcactg	cctgtatttg	105420
ttctgcctc	ccactatttt	ccttagttta	acacaaactc	acctttttta	aaaacatttt	105480
gagagaattc	agtattggga	agagtttcta	acctgtttct	ggaaatggaa	gtccaaagtc	105540
tgtttctgta	attgtttttt	ttttgagatg	gagtctcact	ctgtcaccga	ggctggagtg	105600
caatgacgta	ctctcagctc	actgcaacct	ccacctcccg	gggtcaagcg	attctcttgc	105660
ctcagccccc	tgagttagctg	ggattacagg	tgcccaccac	catgcctggc	tgatttttgc	105720
atttttagaa	gagatgggg	ttcgccatgt	tgccaggct	ggtcttgaac	tcctgacttt	105780
gtgatctgcc	cacctcagcc	tcccaaagtg	ctaggattat	gtttctgtaa	ttgtaatata	105840
tttattgttt	ttagaaactg	tctttgcttt	agtggttaatt	ttcaataaaa	atagaaatag	105900

91/122

cagtggagtt	attaaaagag	cattagttac	atttttccct	ttttcattat	cttcaaatat	105960
tatatatagt	aagtttgacc	tttttaaaat	gtatacttgt	atcagtttta	acacatacat	106020
agattccctgt	aactgtcacc	actataaggg	taaaagaacag	ttagttcctt	cacctttgaa	106080
gtcaagcccc	acctctatcc	caacacttgg	caaccgctga	tctttctccg	tctcaatagc	106140
tttgccctttt	ctcttttttt	ttcttatttt	tttttttgag	acagcgtctt	gctctgtcgc	106200
ccgagctgga	gtgcagtgag	gcaatctcgg	ctcactgcaa	cctccgcctc	ctgggttcaa	106260
gcagttctcc	tgccttagcc	tccctagtag	ctgggattat	aggcacgcac	caccacaccc	106320
ggctgatttt	tttgattttt	tagtagaaat	ggggtttcac	catgttggcc	aggctgggtc	106380
caaaactcttg	acctcaagtg	atccacctgc	ctcggcctcc	caaagtgtcg	ggattacagg	106440
cgtgagccac	tgtgcccaat	caggactttt	tttttttaaa	tttacattca	acttgtcatt	106500
tttttcttgt	atggatttgt	ccttcagagt	cacacctaa	agccctttgc	ctaagcaaa	106560
gtcatgaaga	ttttctcata	tgtttccctt	taaaagtatt	gtggttggcc	agggtgccatg	106620
gcttatgcct	gtaatctcag	cactttgaga	agctgaggtg	ggcagattac	gaggtcagga	106680
gatcgagacc	atctctggcta	atgcggtgaa	accccatctc	tactaaaaat	acaaaaaaa	106740
aaaaaaattga	cgccggcgctg	gtggcgggca	cctgtagtcc	cagctacttg	agagggttag	106800
gcaggagaat	agtgtgaacc	cgaggaggtgg	agcttgcagt	gagccgagat	cgccgacctg	106860
cactccagcc	tgggcaacac	agtgagactc	catctcaaaa	aaaaaaaaaa	agtattatgt	106920
ttttacactt	tacgtttaga	tatatatctt	ttttgagtta	atgtcgtata	agtatgagg	106980
ttacgtcaga	ttttttgttt	tttggtttatt	tttacatatg	gatgtctagt	tggttctaata	107040
ccatttgttg	aaaagacaac	ctttactcca	ttgaattgcc	tttgactttt	tgccatattt	107100
gtctagacct	gtttttggac	tcctttgtct	gtttcatgat	gtgtgtgtct	attcctttgt	107160
taataaccaca	tggctctaata	tactgtatag	taagtcttaa	aattgggtaa	tgctggcctt	107220
ataaaacgaa	ttgggaagtt	tttattttta	ctcttatttc	cattttctag	aagagattgt	107280
gtagaattgg	tgtcattttt	tcctttagata	tttggttgaa	ttgggaagtg	atgccatctg	107340
ggcctagggg	tttggttttt	gtgtgtgaga	cagagtctca	cttctgtcac	ccagggttga	107400
gtgcagtggt	gagatcttgg	cttactgcaa	cctctgcctc	ccagggtcaa	gtttatcctcc	107460
tgcctcagcc	tcccaaatag	ctgggattac	aagcgtgtgc	caccatgccc	gactaatttt	107520
tgtattttta	atgcagacag	ggtttcacca	tgttagccaa	gctgggtctcg	aacttgtgac	107580
ctcaagtgat	tagcccacct	tggcctccca	aagtgttagg	attatagatg	tgagccaccc	107640
tgcctggcag	gggttttggg	ttttcttttt	cagagtattt	taaactatga	attcagatta	107700
tttaatatgat	ataggactat	ttaagttatc	tgtttcttct	tgagtgaatt	tttactgtag	107760
tttatggcct	ttgagtaatt	aattgtattg	aattgtcaaa	tttatgagcg	tgtaattatt	107820
tatatagactt	cgggttttga	gtggatccc	ctttttatcc	ctgggttggg	caattgtgtc	107880
ttgtttttct	ttgtcagatt	gtatagggat	ttattagctc	tttcaaagaa	ctagcttttg	107940
ttttgatttt	tctgtgtgtt	tgttttcaat	tttatgtatt	ttctgtctct	tattatttct	108000
tttctattat	ttctgcttgc	tttggtttta	ttttactcct	ttttttttct	ccaagttgct	108060
taaagtagaa	acttagattt	ctgggttgag	acctttcttt	tctaagataa	gcatttaata	108120
ctgtaaatat	ccttctaacc	actgcttag	ttacaccccc	acaaattctg	gtattttgaa	108180
ctgagcacaa	atgaaatggt	ctaatttccc	ttgaatctta	ttcttttacc	aatgaattat	108240
ttagaatat	gttatttagt	ttgcaagcaa	ttggagactt	ttttctctgt	atttttctac	108300
catttatattc	tattttcatt	atattatggt	cagagaatat	attttgaatg	atttcattta	108360
ttaattttta	aaaataacat	taaaaaattt	tttaaaatgt	gaatatacca	catacagtat	108420
aaagattgta	cattctgttt	ttggacagtt	ttctataaat	gtcaagttga	tttagttggt	108480
taatgatggt	gttcagtttt	tccttattct	tgctgatact	ttgtatgcag	ttatatcact	108540
ttattactca	gaagagtgtt	gaactttcca	actacaattt	ttttttccaa	ttttactttc	108600
agctctatct	ggttttgctt	catgtatttt	gaggctctgt	tgtaggtgtg	gtacacattc	108660
aggatgatat	cttctgggtg	aattgcctgt	tttatcattt	tgtaattccc	tccttatggt	108720
aattttcctt	gttctaagat	cagaaataac	tgttgtccaa	tttatataga	cactgcagct	108780
ttcatttgat	tagtgcttgc	atggcatatc	tttttccatt	tttttacttt	tgatctacct	108840
ttataattct	atttaaaggg	ggcttcttgt	aggcagcata	tagttgggta	gtgttattta	108900
tttatttatt	tattttattt	tttatttatt	tattgagaca	gagttttgct	ctgtgtgccc	108960
aagctggagt	gcagtggtgc	aatcctggct	taccacaacc	tccacctcct	gggttgccagt	109020
gattctcctg	cctcagcctc	ccaagttagt	gggattacag	gcacgcgcac	catgcctggc	109080
tgattttttg	tatttttagt	agaaacggat	tttaccatg	ttagccaggc	tcgtcttgaa	109140
ctcctgacct	cagggtgatcc	acctgctttg	gcttcccaaa	gtgctgggat	tacaggcggtg	109200
agccactgca	cccggctgag	tcatgttatt	tttaattctt	tctcacaata	cagggttttt	109260
gttggttaaat	tttaattatt	taataataat	tttatataaa	ttatttacat	taaatgtaac	109320
tggtgcaactg	gggtattttat	aatgtgtaaa	tataattatt	ggtattaata	taattatatt	109380
actcataata	atattaatat	ctttggattt	agattaccag	tttagtatat	gtttttctgt	109440
ttctccctct	ttgatttccc	cttttttgc	tttttttttt	ttttaattct	tatttttttt	109500

92/122

tagtatttgt	tgatcattct	tgggtgtttc	tggagagagg	ggatttggca	gggtcatagg	109560
acaatagttg	aggggaaggtc	agcagataaa	catgtgaaca	aggtctctgg	ttttcctaga	109620
cagaggaccc	tgcggccttc	tgcaagtgtt	gtgtccctgg	gtacttgaga	ttaggagtg	109680
gtgatgactc	ttaacgagca	tgctgccttc	aagcatctgt	ttaacaaagc	acatcttgca	109740
ccacccttaa	tccatttaac	cctgagtggt	aatagcacat	gtttcagaga	gcaggggggt	109800
gggggttaagg	ttatagatta	acagcatccc	aaggcagaag	aatttttctt	agtacagaac	109860
aaaatggagt	ctcccatgtc	tacttctttc	tacacagaca	cagtaacaat	ctgatctctc	109920
tttcttttcc	ccacatttcc	cccttttcta	ttcgacaaaa	ctgccatcgt	catcatggcc	109980
cgttctcaat	gagctgttgg	gtacacctcc	cagacggggg	ggcagctggg	cagaggggct	110040
cctcacttcc	cagatggggc	agccggggcag	agggcgcccc	cacctcccag	acggggcagt	110100
ggcggggcgg	aggcgcccc	cacctcccctc	ccggatgggg	cggctggccg	ggcgggggct	110160
gacccccac	ctccctccc	gacggggcgg	ctggccgggc	gggggctgac	ccccacctc	110220
cctcccagat	ggggcgggctg	gcccggggcgg	ggctgcccc	cacctcccctc	ccggacgggg	110280
cggctgccc	gctgaggggc	tctcacttcc	gcagaccggg	cggctgccc	gcggaggggc	110340
tcctcacttc	tcagacgggg	cggcggggca	gagagctccc	tcacctccca	gatgggggtg	110400
cggctcgggca	gagacactcc	tcagttccca	gacggggctc	cggccgggca	gaggcgctcc	110460
tcctatccca	gacggggcgg	cggggcagag	gtgggtccca	catctcagac	gatgggctgc	110520
cgggcagaga	cactcctcac	ttcctagacg	ggatggcagc	cgggaagagg	tgctcctcac	110580
ttcccagacg	gggcggccgg	tcagaggggc	tctcaccatc	ccagacgatg	ggcggttagg	110640
cagagacgct	cctcacttcc	cggacggggg	ggcgccgggg	cagaggctgc	aatctcggca	110700
ctttgggagg	ccaaggcagg	cggctgggaa	gtggaggttg	tagggagctg	agatcacgcc	110760
actgcactcc	agcctgggca	acattgagca	ttgagtgagc	gagactccgt	ctgcaatcct	110820
ggcacctcgg	gaggccgagg	caggcagatc	actcgccgtc	aggagctgga	gaccagcccc	110880
gccaacacag	cgaaaccccc	tctccaccaa	aaaatgcaaa	aaccagtcag	gtgtggcggc	110940
gtgcgcctgc	aatcccaggc	actctgcagg	ctgaggcagg	agaatcaggc	agggagggtg	111000
cagtgcggcg	agatggcggc	agtacagtcc	agcctcggct	ttcacaactt	tggtggcatc	111060
agaggggagac	cggggagagg	gagagggaga	cgagggagag	cccccttttt	gctttctttt	111120
ggattatttg	aatttttctt	ttaaatttatt	tatcttactt	atttatttat	ttttttgagt	111180
gattctcctg	ccacagctcc	caagtagctg	ggactgcagg	catgtgccac	tacacccagc	111240
taattttttt	gtattttttg	tagagacagg	gtttaccat	attggccagg	ctggctctga	111300
actcttgacc	tcaagtgatc	cacctgcctc	ggcctcccaa	agtgtctggg	ttacaggcgt	111360
gagccaccat	gcccctgcctt	tttctagaat	ttatatattg	agttcttgat	tgtatctttt	111420
tatgtagctt	ttttagtggc	ttcttaggta	attacaatat	acatactttt	cacagtgtac	111480
tcacatttaa	tattttgtaa	cttcaagtgg	aatgtagaaa	acttaaccac	cataaaaaata	111540
gaactagggg	tgagggttaa	aaagagagag	aaaagaaaatg	taataaagat	ttaataaacac	111600
cgtttttttt	ttttttttct	ttttttttct	gagacgagat	ctctctttct	gttaccaggc	111660
tggagtgcag	tggcgtgatc	ttggctcact	gcaacctccg	cctcctgggt	tcaagtgttt	111720
ctcctgcctc	agcctactga	gtagctggga	ttacaggtgc	gcgccaccat	gcccagctaa	111780
tttttgattt	tttagtagag	acggtttcac	tgtgtggcc	aggatgggtc	cgatttcttg	111840
accttgtgat	tcgctctcct	cagcctccca	aagtgtggg	attacaggcg	tgagccaccg	111900
cgccgggcta	agtccttaaa	tatttttttg	acattgcact	ttttctcttt	tccttctagg	111960
atttttagtaa	cccaaagtgt	agttttgtta	ttgtttggca	ggttcctgag	gctttcctta	112020
cttctttaaa	tttttttttc	ctgttgttca	gcttcgaaaa	tttctattca	tctgtcttca	112080
aattcactgg	ttctttcccg	ttatttccat	tctgttattg	agtcttttga	gtgaatttta	112140
aattttgttt	attatgtttt	ttagtcttaa	aattttcttt	ttttgtgtat	gtcttatact	112200
ttgctcctga	aactcttatt	tgtttcagga	gtgatcttat	ttcttagagc	atggtttttag	112260
tagctactta	aaatttgttt	tatcatccca	gcataatgtg	cctcttgatt	gtcttttctc	112320
ttgtgagata	atgggatttt	ctggttcttt	atatgacaat	taatttttga	ttgtatcttg	112380
gacagtttga	cttacgttac	atgattctga	atcttgttta	aatcctgtgg	aaaatattga	112440
agtttttgct	ttaacaagca	gttgacctag	ttagggttcag	tccacaaatt	ctaagcagca	112500
ttctgtcgcc	tctgggtcca	tcacagttc	agttttgtat	cttatctgct	tatgtgcctt	112560
tctgtgtcca	gtctgggacc	tggccaatgg	tcagggtcca	aagcctttgt	acacttttag	112620
aagcaggggc	atgcacaccc	agctcacgag	tggccccggg	agtgcacata	caactcgagc	112680
tttctatggg	ctccttcttt	tctgtgatgt	cctgcacacg	ttctgccttc	taagaacctc	112740
cctttatccc	tttctgtttg	tctggctaga	aagtccaggc	tttagattcc	ctatacttca	112800
gcacacttcc	tgtagctatg	tcaacctctg	tggccacgac	ttcttcttct	tgggactgca	112860
gtttctcttg	tcagaaaagta	ggattcttgg	agctgtctgc	attgtgtctc	tggctgtctc	112920
gatgctgcct	gggagtcgaa	ggagagaaa	gaacaaaaca	aaacaaccca	ggggatttcc	112980
tcactctctt	ttgatccgtg	agagccccct	ttcctgttcc	tcagaccaga	aatagagggc	113040
ctgtcttggg	acttcttctt	tgtgcactcg	gtgtgcagtt	tcagcttttg	agtcagggcc	113100

93/122

aggaggtgct	ggacaaactt	gtcaggagta	cggaggtact	gcaagttctg	attacttttc	113160
tcagtcacc	tgcttccaag	tccttggatg	catttgtcca	ttgttttgag	ttgcattcca	113220
tgggagagac	agaagagtgt	gcttatttca	tcttgacata	cttatttagga	ttcatatca	113280
aatcaacgga	tgatattctc	tatatataat	tgctgttttc	cctttagcaa	gcacattagg	113340
aaaataacac	tttaacaccc	gcctttgggt	gtttctgtca	taattattaa	tacttgactt	113400
tttttttttt	tttgagacgg	agtctcactc	tgctcttga	ggcattgtcc	ccataaactt	113460
ttggtaaagc	atcaataaatt	ttatctttca	cccacacaag	cttcaccata	aatttgatgt	113520
ttattcttcc	attttagcag	aattcatggt	gctccaatag	gggctgtctt	caaactgatg	113580
ttttctcctt	cttagtgcc	cagagtagat	cctgttcaga	tacgttataa	caggtaata	113640
tgagtttatt	ttgggtgtaa	agtactttga	aattcatgca	tagttttttc	atcatatgca	113700
ttttccatag	ctttgaacac	ccccatgtaa	ctctcctctt	ccacaaacca	aacaatgaaa	113760
aagcaccttt	gtgatggaag	tttattttgc	ataaggaaact	cacagtgtatc	taagccctgc	113820
tattcatgaa	tataattcat	tactggagtc	caagttgctt	tttggttttt	gaagttctct	113880
tcttcccttg	cagggtataga	acaagatgca	gtgaatactt	ttaccaaata	tatatctcca	113940
gatgtctgcta	aaccaataacc	aattacagaa	gcaatgagaa	atgacatcat	aggtaagcag	114000
tgcttgaaac	tatggcaaaa	aaaaaatgac	aaaaaatgca	cagaactgac	aattttcggt	114060
attgactaag	ataatttttt	cttaacatgg	aattttagcag	ttcccttcct	aatttgtttt	114120
ctgagtattc	tttatatcgg	attatagctc	actttaaaag	tttctcggct	gcattcgggtg	114180
cgaggtgctt	tgcttgggccc	agatgggctg	cagtgtagcg	gggtgctcagg	cctgcccgtc	114240
gctgagcagc	cgggcccggcg	ggcgggctacg	ctaaccggca	cagaccaccg	gatggactgg	114300
ccggcagccc	gcacccagtg	cacgaagtgg	gcgggacaga	aacttctggg	gttgggaagt	114360
cagtgaggct	aaaagccggt	accaaagtct	ctaggcatca	gggctgcagc	ccaagagtct	114420
cacgaccagt	gggcaactgg	atggccagac	agggtgtctca	gtggtggcct	ctccgtctca	114480
gggcttcac	ccacttctca	gtgggcttga	cgctccctggg	caccctggat	gtctacctgc	114540
attagccaga	gcatcaccat	ggcctgtgac	ttgccttttt	ttgccagttg	attgtgccac	114600
acacagtgtc	atttctgtgt	catttggcac	agctggaggt	gcaaggagga	gggcagcctc	114660
atgtccagtc	ccagttctca	gtaactttat	tcttctgaat	aaagacaatt	tgctaacctt	114720
aaaaaaaaaa	aaaaaaaaaa	agtttttctt	atatgttggg	cccaaattct	taggctttta	114780
cctgaataac	aatgacagca	agatcaataa	atagtacaca	tttattaaac	actcactgtg	114840
tcccagacaa	tattccaagc	actttttatg	gatagactca	ttttaacttc	taaagaactt	114900
tgtgggataa	atacagttat	tttatagatg	aagaaactga	agcacagaga	agttaaagtgc	114960
tttgtccagg	gtaacagctc	agatatggca	gagtcaggat	ttgaaactag	accctcacat	115020
accttaactg	ctgtctgtg	gcagtgtttt	tcatactgta	gggtgggacc	agccttctct	115080
tatgccttca	ccccctgcc	aaaaaaaaaa	aaaaaaaaaa	aaatatatat	atatatatat	115140
atatatatat	atatatatat	aatatatata	tatatataat	atatatatat	ataaaatata	115200
tgtattagta	tatatattat	atatatatat	attatatatt	agtatatata	ctaatatata	115260
atatacatat	tagtgtgtgt	atatatatat	atactagaat	aaaaaaatca	aagtatctca	115320
gagttagtaag	gacaaacatt	tcagaaaaat	gttttcatta	tatatacatg	tatgtatgtg	115380
tatgctgatt	caacaaatat	atttcttata	ggttatagca	aaatagtttg	aaagctttta	115440
ctgtgtttta	tcaggaagac	cttaggtgaa	cgtatattca	cagataaaaag	aggttattta	115500
ttcattcaat	aaatattaca	ttctcataag	tcctaataat	atgtattttt	attcttcaaa	115560
aaagttagta	tttgtgattt	atgaaataag	acatgttctt	gcacttttag	cagatctgtc	115620
ccgatgttgg	gcttctttaa	tccttagtgt	gggtgctttg	cactcactca	ctgctgggga	115680
cagcaagacc	cctgttagtc	tcagctgtgt	ttcttaaat	ggccactgt	accttccagt	115740
tagctattct	ggggtccatg	tcagtgtggc	ttcttttct	tttctttct	cccacacaga	115800
tacctataac	ggctataaca	taggcctggt	ggctgtgggt	ggcttatccc	tatctgcttg	115860
tatttaaggg	gtactgtttc	actgagtttt	gctgacagat	gttgatcatga	gatttgaggt	115920
tttctgtgtt	gtgtctctat	ttttatgtgg	gaatttgcta	ctatcatcat	ccctagacca	115980
gcttttcccta	gtaatacaac	agggatgttc	tgactgatta	gagtttgcct	gtttgaagaa	116040
ttggttggtc	agtgattttt	ttttgagggg	agtcgtgacc	agttaatagc	ctgactggcg	116100
tgtggataaa	aaggaagcag	tttcaagtca	aataaaacac	ttaaaatgaa	accacactgc	116160
aactctcttt	cttttactta	agcttaatca	aattaatgat	gatgtaatcc	catgaaggaa	116220
aagtcttctg	aaggatcaag	ttgataacat	tttgtgatca	aagaatttga	gaaaacctct	116280
atcccagtg	ctcatcattat	atatttttagg	atgttaatta	cctgtgtggc	tttaggcaag	116340
tcatttttcc	tcttctgacc	ccattcttaa	tcctgtccaa	attatttgtc	tcctcttgca	116400
gttggtactat	tttaatatag	ctgtccttca	agtgagtttt	gttcaaagga	gccttcactt	116460
tagctcttac	tgtgtaccca	ctttgcatag	tcttgtttta	aatgtaatcc	ttggattttt	116520
gggtgtgcta	actaattact	gtttttatgt	gaggatttag	agtgatccag	aactataact	116580
tgcactacct	ccttcatctt	ccacaaatgt	ttgaagtggg	agaattttta	aaaactttga	116640
aggtagacgt	gacagaattt	gctgatgggt	tgggaagtgag	tggtatgaga	gggaaaaaaa	116700

94/122

ggaataaaagc	atgactgcat	tttttgtttg	tttgtttgtt	tgtttttgag	acggagtctc	116760
actctcgcca	ggctggagtg	cagtggcggtg	atcttggctc	acggcaacct	ccgcctcctg	116820
ggttcaagcg	attccccctgc	ctcagcctcc	caagtagctg	ggactacagg	cgctcgccac	116880
cacgcctggc	taattttttt	ttttgtattt	tagtagaaac	gggttttcac	cggtgtggcc	116940
aggatggtct	ccatctcctg	acctcatgat	ctactcacct	tggcctccca	aagtgtctgag	117000
gttacaggca	tatatataag	catataaaagt	gtgttatagc	atacaaacag	gtatatatat	117060
aaacatgcag	tccacacagc	tgataggaat	gaggcagtag	tgaaggagaa	gttgatgtag	117120
gagaggggac	agttgttaca	ggaaagaagt	ctggaggcag	aagggatgaa	ttccagtgtc	117180
cacatagaag	attgcttaga	tgggagcaag	gacaatttat	ctagagtcc	aggaaagaat	117240
gcagtagacg	ggtagagatg	caggtgagtt	gaaagatgtg	agagatgatg	gaaataattt	117300
tctgattgct	tctatattct	caaggaagca	ggaagcaaa	tcctcagcaa	agagaataga	117360
agaggtgtta	aatttttgag	aaaggagatg	tactgtagaa	aaaaaaaaaa	ctcagtttct	117420
ccttctgaac	tctcacaaaa	cagaaccctt	ccatgactct	agttgtgtgg	ggttttttcc	117480
ctgtcagcta	ccaattctgc	agatgattgt	tcagtgaaca	ccaactgggt	gtcctctaag	117540
tcagttcagt	tctcacactg	ttacactgga	gatagcatca	gatccacag	attgaggagt	117600
ctgtcccaca	agactgcctc	cacttcagat	gccagtctca	agtacaagtt	gtggcctgtg	117660
cttctgactg	acctctcata	aattggagtt	cccacagtcc	cctccttggg	ttcaataaat	117720
ttgttagagc	agctctcaga	actcagggaa	atgtctttaca	tatatattacc	catttattat	117780
aaaggatatt	acaaaggata	cagattgaac	aggcagatgg	aagagatgca	tgggcaaggt	117840
atggggagag	ggcacagagc	ttccatgcac	tctccaggtc	atgccaccct	ccaagaacct	117900
ctacagattt	agctattcag	aagccccctt	ccccattctg	tccttttggg	ttttttgtgg	117960
agacttcatt	atataggcat	gattgatcat	tggctattgg	tgatcagctc	aaccttcagc	118020
cccctcatcc	cgggaggttg	gtgggtaggg	ctgaaagtcc	caaactgtga	attctgcctt	118080
gggtctttctg	gtgattagcc	gtcatcctaa	agctctttag	aggccacagc	cacaagtcat	118140
ctcattagcc	ttcaaaagaa	tccagagatt	ccatgaattt	taggcgctgt	atgctaagaa	118200
actggctaaa	ggccagttgc	aattgtctcag	gcctgtaatc	ccagcaactt	gggaggtgta	118260
ggcaggagga	tcgtttcagg	ccatgagatc	aaaaccagcc	tggccaacat	agtgaagacc	118320
ccttacaaaa	aatttaaaaa	ttggccaggg	gtaatagctc	ttgtctgtag	tctcagctac	118380
tcagaaggct	gaggatcact	gagccctgga	gttgaaggca	gcagtgaagc	atgatcggtg	118440
cactgactcc	ggcttgggtg	acaaagtggg	accttgtctc	agaagaaaaa	ggaaaaaaaa	118500
aaaactgggc	aaagactaaa	taacatatatt	cacagtatca	cagatttgta	ttgtctagga	118560
aagtgaatgt	aaacagacca	ggacactagt	atgatccctt	ggtttcatga	aggtcccact	118620
aaagtcatga	acacaaagtg	agactaggca	tcattgttata	tggtttttcc	agccatgttt	118680
aacagctagc	taaatagcta	attgtttcgc	tgcagtttat	tttagcagtt	ccttatttta	118740
gcacatttca	tgttttaaaa	tttctaccaa	taacatttta	ataaaacttt	ttacagataa	118800
cttcacaaat	ctcataattt	ttaagttaca	atcccagaaa	tagaattgct	cattgaaagg	118860
gtatgttcat	ttttaaaagt	atgctagaaa	ctgccaaaat	gccttcagaa	aaaggtgttt	118920
gtatccccac	taacactagt	gttagttttc	ttgtgccctt	gctcaagtat	acataattat	118980
aaaaacaatg	ttggggccagt	ttactagata	aaaggtgtag	tgcctcctta	ttctaactca	119040
tttgattact	agtgtgtatg	tatgtctttt	cacgttggtc	attttatgtt	tgttcccttg	119100
tggattgtca	tgtcctttgc	tcatttttct	tttggaaact	ttcttagtag	tttataagag	119160
ctcttggtat	tttaatgata	gtaacctttt	aactgtcatg	catgctgcaa	atcttttttc	119220
tgtttgtttg	cctttgtatt	ttgttttttg	agggtttcta	tgtataggaa	ttaaatttta	119280
tgtttgttaa	tcttttgatt	tctgtctttg	catatgtact	tcaaaaagact	ttctatttta	119340
agatcaagtg	ttacctgtat	ttctctttag	ttctatttaa	aacctcttaa	tttatatgcc	119400
tgtgtctgta	actcccaagt	tgattcacaa	gtgtgtatac	atagtttgaa	tttagtggca	119460
atttaattat	ttacaacttc	ttttgcagca	aggattttgt	gagaagatgg	acaggtggat	119520
cccaactgtt	tcgttttggc	acagtccata	gtcttttagt	caatggagca	agagtaagtt	119580
agttcatatt	ttcacattgt	gcatacctagg	gaatttgggt	tcattgttag	gaatgggctt	119640
cactcagcta	aaaacaaagt	atttttgaga	atttaaatat	tttggtattt	tacaagatca	119700
tataaagcat	actctatctt	ggttaacagt	ttcttttaaa	tataaatatt	gtgaactcct	119760
aaaattttca	ttttcatttt	caatgttaat	atttcctaag	ttaaaataat	ttgtttttag	119820
ttctgaaata	atttggggag	tgattgagtc	tgtagtgtat	atgactatta	gaattgggtt	119880
atttatttaa	ataatgcag	tcttcagatg	gctctcctaa	tttgtagttt	aggcttttaag	119940
ctaaatggat	gcatataaac	taaatccaca	tcatcttgtt	gaaatggctc	cagaggtttt	120000
ttagattttat	tactgtcatg	tgcccttaaa	aaaaatctat	tcattctttc	acttaacatt	120060
tatcagaaga	gtgctctgtg	taagacgtgg	ttaggcatag	tgccagctct	gaagggaagt	120120
acagcctaatt	aaaagacata	gggcatgttg	tttggttact	gtaatatgaa	gtggcatgtg	120180
ttaaatgtca	ggggagaaact	acaaagtcat	aaaaaggtgg	gagagattac	atacaggtaa	120240
aggaatcagg	aatgacacca	tggggagtaa	ggtagtgttg	acctaggcct	ttaagatata	120300

95/122

atagggacag	tatggaaaga	gtatatTTTT	cccacttaaa	ctctttcctt	ggtcgttccc	120360
tcaaattttc	ccttttgtcc	atgtgcaggc	acttttagtga	gtttctgcca	agtcaccatt	120420
tctgtaaata	ccagattgaa	gtgctgacca	gtggaactgt	ttacctggct	gacattctct	120480
tctgtgagtc	agccctcttt	tatttctctg	aggtaaagtc	tgcatttctt	ttcacactct	120540
attcgagcat	tccagcctct	aactatcaat	gctggggccc	tgtctatagg	aaataacaca	120600
gaagagccaa	gtcatttcca	aaaagatgta	tcattgtttc	aagttgtttc	tgatggcaag	120660
agtaatttaa	taatatatta	gagagaacat	gaaaattcaa	tgtattaaat	aactctaatt	120720
ttgagaaacc	taattaaact	actgcatgta	agagagtga	tgtttttaat	tatttggagc	120780
tattttaaaa	ccacagaatt	tgaaacttgc	ttccagtga	taaattgcag	accagacttc	120840
agaagagaaa	aaaagtagta	aattttttct	tatgctcatc	atttttactt	tagtcacttg	120900
ataggattgc	ccagtgaaga	agcatttgca	acagacaatg	agtataattaa	tccttttgag	120960
gcatacagtt	tagtataatg	ctctttgtta	ggcttcaaca	agtgaatta	ttttgttggg	121020
aagcaaatga	ctattaagta	gaaagaggat	ttccagtctc	acaaagcagt	aatttagaca	121080
ctcgattctg	cctctttaca	agaatacagg	tactcagtgg	atttgttttc	tcactccctt	121140
tccttgctat	aagtttaaat	caacaatttg	tttaggttaa	tatgtcctca	tggaatgggt	121200
gaaatgatca	gataaaaaat	atttggtttg	gttagtttac	tccttatatg	tttgctggca	121260
aggaaccaca	aatccagttt	agtataattt	ttactctagt	tcactaaaag	tttgcattcca	121320
gctgtgtagg	tagtgtttgt	tccttggtta	cttttttttc	gtctaaaaga	atactttaaa	121380
acttttcaat	ctcaaatgac	tgtaacttgc	tgacagggtg	taacagaaga	agtagatctt	121440
tttgtttttt	gcttatgacc	tgtattttaa	tatttgagct	tatagattag	agattgtgag	121500
agaaatctgt	tatatgtctt	atttccctt	gtgtattttt	tcctcctagt	acatggaaaa	121560
agaggatgca	gtgaatatct	tacaattctg	gttggcagca	gataacttcc	agtcctcagc	121620
tgctgccaaa	aaggggccaa	atgatggaca	ggaggcacag	aatgatgcca	tgattttata	121680
tgacaagtga	gttatattga	tagatggatt	cagcagatag	ttattgaaca	tttgatatgt	121740
tttgtggaaa	taaagatgaa	taaaactcag	ctctgtgtgc	aaggagctca	caggaggcag	121800
cataaaagct	gctttttatat	ggtgtttgta	aaagcttggg	ggttcttaga	acaaaagttt	121860
ctgctgggaa	aggggagggtg	tatgtggggg	aaacaggatg	gcaatggtgg	tggtcaagga	121920
gtgtttccca	gaagagagat	tttgtttgga	ttcccaaagaa	agaagggaat	tttgctaccc	121980
agagaaggca	gaaaacaaca	ttctaggcaa	aggcattggc	ccagaagcca	tggaaacgta	122040
ggggaaagtg	gcactttcaa	gaaacttgag	tttagataat	caaaggagtg	gggaataaat	122100
atgaggatgc	tggtactaat	tggaatagat	tgtaaggggac	cttgaatgcc	tattttatggg	122160
tatatattac	tttctgtata	aatctgctca	ggcacgttgt	taattagttt	tttattagtt	122220
ttcactgaaa	atgagaggat	ggaaacatca	tacagttaac	aaaattgaaa	atatctggtc	122280
aggcagatga	tgagcttgtg	gccagctctg	taacgtatgg	tattcttttc	atttaacttt	122340
tcttactctg	taaaaaaagt	aattcgttgt	cgggcacggg	ggctcactcc	tgtaatcaca	122400
acactttgag	aggcagaggc	agggtgaatcg	cttgagccca	ggaatttgag	accagcctgg	122460
gcaacatggc	aaaacccggc	tttactaaaa	atacaaaaat	tagctgagcg	tgatggcggtg	122520
cgctctgtgt	cctagctact	taggggcctg	aggcagaagg	atcacctgag	ccttggggagg	122580
tcgaggctgc	agtgaactgt	gatccactgt	actccaccct	gggcaggggca	gtagagtggg	122640
accctgtctc	caaaaaaaaaa	aaaaacaaca	aaggtaattt	gttatttgta	tccttaagca	122700
aatgctaaag	gggttaacttg	gggatagaga	aaagtcacac	gatgttaggg	tttgaagaca	122760
ctaatagtat	ctaggccagt	ggttcctgaa	cattagtctg	tgggctcttg	ctgggctgtc	122820
tgcataggaa	tcacctgaga	gcttattaaa	aataggtttt	caggctgggt	gcggtggctc	122880
acgcctataa	ttccagcact	ttggggaggct	gaggcaggcg	gattacttga	ggtcaggcgt	122940
tcaagaccag	cctggccaac	atggttaaac	cccgctctta	ctaaaaatac	aagaatttagc	123000
caggcatgat	ggcacacacc	tgtaatccca	gctactcagg	aggctgagga	aggagaattg	123060
ctcgagcccg	ggaggtggag	gttgcatgta	gcggagatca	tgccactgca	ctccaggctg	123120
gctgcagagc	ggagactctg	tctcagaaaa	aaaaaaaaaa	ataggttttc	agtcctgggtg	123180
ccggtggctc	acacctgtaa	ttccagcact	ttgggaggcc	aaggcaggca	gatcacttga	123240
ggtcaggagt	ttgagaactg	cctggccaac	atagtgaaac	cttgtctcta	ctagaaacta	123300
caaaaaatta	actgggcatt	ttgacgggtg	cctataatcc	cagctactag	ggaggctgag	123360
gcaggagaat	tgcttgaacc	cgggaggcag	aggactgcat	ctcaaaaaaa	aaaaaaaaaa	123420
aaaggtttcc	agtcctccctg	tctcagaaat	tctgattctg	caggtttgag	gtgtgaccag	123480
gaatctttat	ttttagaaga	cataccagat	aattctgata	aatagccagt	ttagggtagt	123540
agtctaattt	tcctattttg	caagtaagga	aaataaggcc	cagagaggta	atgattttct	123600
caaagtcaaa	gaacaagtta	gtggcagaat	ttggactgga	atgcagtctc	taatgttctg	123660
tccagtgttt	attctggtac	agtatgtttg	tagaaggat	tacgtaagaa	acattgttat	123720
atagatgttg	agctaggaag	agttttacatt	tagaaaattg	gtctaaaatg	cctgaacatt	123780
caagtcgtgg	aggagtattg	accaacttac	tcaatacaac	ataggagatt	cacattttgt	123840
tacaaaaatg	ctgattttaa	aggagagttt	tctttttttt	cttctttttt	atttttttgg	123900

96/122

atggagctctt	gctctgtcac	ccaggctaga	gtgcagtgac	acgatctcag	ctcactgcaa	123960
cctccacctc	ctgggttcaa	gcgggtctcc	tgccctcagcc	tcctgagtag	ctgggattac	124020
aggtgggggc	caccacgccc	agctaatttt	tgtattttta	gtagagacag	ggtttcacca	124080
tgttggccag	gccggtcttg	aactcctgac	ctcaagtgat	ccaccaccca	ctgcctccca	124140
aagtgtctgg	attataggcg	tgagccactg	tgcccagcct	gcttgttttt	gtatcatata	124200
tatgcatcat	cataatcatg	cattatcaac	ctttgtattt	ctgtcaggac	atagaaacca	124260
ttagagtgct	tggagagag	cctttttttt	ttctctcgcat	ttaatgcttt	ttttgggtatt	124320
catttcataa	tcagcttacc	aaaacattac	ctgcattata	ccccatcaag	gtagaaatct	124380
ttgtgttatc	aatattgggt	actccctttc	cacaccgagt	catcagtaag	tcctgttcta	124440
tccaaatagg	tcatatgcat	ctagctcacc	cctcagtgct	gttttggttt	gaatttgtac	124500
atgtttactc	ctgatgcctt	gtagtattga	tgatgtgttc	ttattttatt	ctgtgcatac	124560
aagttctcag	ctcgcttttt	agggaaaatg	accatgtcct	cctttcctat	aaattccttt	124620
ctatctatca	agtcctcaac	agagaaatagg	taccataaaa	tatgtgatgg	ttagtttctt	124680
tgccctcagt	gtagctctgat	ccttacagct	tttaaacac	agtagagttc	accgtcaaga	124740
actaaggatg	gtgggcaggc	agatagaaag	gtagcaagtt	gacccaacta	tctctgggga	124800
agtgggaaca	aagaaagggt	acatcagcac	tgtcatcaca	tagctctata	gttctaggcc	124860
tgagggtcga	atcaagtagc	cttgatataag	attctctgga	ggaggtgctg	aaagttgctt	124920
atacttgcta	tggaaattga	ttttacttcg	gatattcttt	taccataggt	acttctccct	124980
ccaagccaca	catcctcttg	gatttgatga	tgttgtagca	ttagaaattg	aatccaatat	125040
ctgcagggaa	gggtgggccac	tccccaactg	tttcacaact	ccattacgtc	aggcctggac	125100
aaccatggag	aaggtaaccc	agaacttcaa	acgtatcaaa	ctacaagaag	ttttattggg	125160
agaactcata	aaatataagg	tgggaaaacc	aagcagaata	gcacagtggg	aattgaagca	125220
gtccagcaaaa	gtgattaaga	gcagaggcct	tgagctctggc	ctggatgtga	cagtcacgtg	125280
ccacataaca	ttttagtcaa	cagtggactg	cgtgtacgat	ggctcctgtac	gattataaat	125340
gatcaaagct	ggtagtgcga	taataacaaa	agttagaaaa	aataaatttt	aataagtaaa	125400
aaagaaaaaa	gaaaaactaa	aaagataaaa	gaataaccaa	gaacaaaaa	aaaaaaatta	125460
taattggagct	gaaaaatctc	tgttgcctca	tatttactgt	actatacttt	taatcattat	125520
tttagagtgc	tccttctact	tactaagaaa	acagtttaact	gtaaaacagc	ttcagacagg	125580
tccttcaggga	ggtttccaga	aggaggcatt	ggtatcaaa	gagatgacgg	ctccatgcgt	125640
gttactgccc	ctgagacacc	tccagtggga	caagatgtgg	agggtgaaaga	aagtgttatt	125700
gatgatcctg	accctgtgta	ggcttaggct	aatgtgggtg	tttgtcttag	tttttaacaa	125760
acaaatttaa	aaagaaaaaa	aaaattaaaa	atagaaaaaa	gcttataaaa	taaggatata	125820
attgattgat	ttttgtacag	ctgtatatgt	ttgtgtttta	agctgttatg	acaacagagt	125880
caaaaagcta	aaaaaagtaa	aacagttaaa	aagttacagt	aagctaattt	attattaaag	125940
aaaaaaattt	taaataaatt	tagtgtagcc	taagtgtaca	gtgtaagtct	acagttagtg	126000
acaataatgt	ctaggcctt	cacattcact	taccactcac	tcgctgactc	acccagagca	126060
acttccagtc	ttgcaagctc	cattcatggt	aagtgcctta	tacagatgta	ccatttttta	126120
tccttttatac	tgtattttta	ctgtgccttt	tctgtatttg	tgtttaaaata	cacaaattct	126180
taccattgca	atagtggcct	acgatattca	ttatagtaac	atgtgatata	ggtttgtagc	126240
ccaaaagcaa	taggttgtac	catatagcca	agggtgttag	taggccatac	catctagggt	126300
tgtataagta	cactctgtga	tgtagcaca	atggcaagca	gcctaacgga	aattctgttt	126360
attgattgat	tgattgatgg	attgattgag	acagagtttc	actccattgt	ccaggctgga	126420
gtgcagttgc	acagtcttgg	cacactgcaa	cttctgcctc	ccaggttcaa	ccaattatcc	126480
tgccctcatcc	tcccaagtag	ctgggattac	aggcaggcac	caccatacct	ggctaatttt	126540
tgtatttttag	tagagacagg	gtttcaccat	tttgccagg	ctgttctcga	actcctgacc	126600
ttagtgatc	tgctgtcttt	ggcctccgaa	agtgtggga	ttacaggcat	gagctaccat	126660
gcctgggag	taactgaaat	tctctaagtc	cattttcctt	atctgtaaag	tgacgataat	126720
atgcaacgtt	acctcaaagt	tactttgatg	attaaagtaa	ggtaattgat	ataaaataca	126780
tattaacata	gtacctgaca	catggtaagc	atcaaaaaat	gttaactact	tttattacta	126840
ttattattac	gtatttttaa	ataattagag	agcagtatca	aaaattagct	gggcgttagt	126900
gcattgcacct	atagttccag	ctactcagga	ggctgaagct	ggaggattgc	atgagcctgg	126960
gaattaaagg	ctgcagtggg	ccgtgttcat	gcccctgcac	tccagccttg	gtgacagagc	127020
aagaccctgt	cttgaacaat	taaagaaggc	attatgccgc	aacgttagct	tagaaatgat	127080
ccacatatat	caccagtaac	tgtcaacagg	attggaaacc	tagttttggg	tattatgatc	127140
acaagggtatt	attaatagct	tattaataat	aaagcgttgg	ctaggcacgg	cgactcacat	127200
ctgtaatccc	agcactttgg	gaggccgagg	tgggtggatc	acctgaggtc	aggagtttga	127260
gaccacgctt	accaacatgg	agaaacccca	tctctactaa	aaatacaaaa	ttagccgggc	127320
gtgggtggtgc	atgcctgtaa	tcccagctac	ttaggaggct	gaggcaggaa	aatctcttga	127380
acccgggagg	cagaggttgc	agtgaagctg	gatcgacca	ttgcactcca	gcctgggcaa	127440
caagagcaaa	actccgtctc	aaaaatataa	ttataataaa	taaataaaaag	taaagtattg	127500

97/122

atgtttgtga	atgattttatt	cttctaata	actagaggag	atgtttccag	gaatttcaga	127560
gccagtggag	ttatgttgct	tgtatgtgtc	atgtgtatcc	agggtgaaaa	acttaattaa	127620
acgctattat	ataataccat	acataaaaac	tgaatttttag	gaataactgaa	gaatgacata	127680
tagaagtcaa	atcattaaat	agctagtagt	aaacagaata	gagtgctcagc	tgttacccaa	127740
tgatgataat	attttcacga	ttaaaattaa	accttttctg	attttaaagg	aaaagttcag	127800
atctgtatca	tataaagaat	gtaaaatttc	agggtataaa	aattaaaatg	cagagagaaa	127860
aatgcaaaaa	tagttcttac	tagatgtgtg	tatgtaagga	acttagacta	attttaagaa	127920
cactgtcaag	accctggtag	ttaggttaga	aaaaagacat	gaatgattca	ttcaacaaaa	127980
acttttgagta	tttctgtgct	agatggtagt	gttacagtg	taaacaaaat	aaatgtgttt	128040
ctgctatcct	ggagcttagt	ctacaaaaaa	ggtacatatt	ggccgggcac	ggtggctcac	128100
gcctgtaatc	ctagcacttt	ggaagatcga	ggcgggtgga	tcacctgagg	tcaggagttc	128160
aagaccagct	tggccaacat	ggcgaaaccc	cgctcttact	aaaaatacaa	aaattaaactg	128220
ggtgtggtgg	cggacacctg	taatcccagc	tactcgggag	gctgaggcag	gagaatcact	128280
tgaacctggg	agacagaggt	tccagtgagt	cgagatcatg	ccactgcatt	ccagcccggt	128340
ggacaaaagc	gaaaaatcgt	ctcaaaaaaa	taaaaaacaa	caacaaaggc	acgtattaaa	128400
tacgaacata	aatattttaca	aattatactg	aataagttct	catgtttatt	atgtgcttgt	128460
ccagttacaa	acttttctct	cgtagaatta	gaaatataaa	taataaacat	gagaactcat	128520
tcagttataa	taataattat	taaatgtaaa	taaaaacatc	tatgtacaat	taggcattta	128580
tttaagaatt	atttgaaaaa	aaaacaatgt	ggaacacagat	attttgatat	attgctagt	128640
attgaaattg	ataatgttct	tttgaagagt	aaagtgaacca	tatatattaa	agttaaaatt	128700
taactcagca	atcacacgct	tgggtagtta	aatgtaaggaa	atcagtttga	aagtaaaatc	128760
aatatatgca	caaagacttt	aacattttatc	ataaaccaga	aaaatcgagt	ttcaaattat	128820
atcctatgga	ctattttctg	ctaaaaagta	ttaatatcaa	ctttatgtaa	tactttctgt	128880
acaaatattt	tgggggagaa	aaccaaccaa	aatttacctgc	attgtaattt	tttttttttt	128940
ttttttttta	gacagctctg	ctccagcgtc	caggctggag	tgcagtgggtg	caatctcggc	129000
tcactgcaac	ctccatctcc	caggttcaag	caattctcct	gcctcaggcc	tcccagtag	129060
ctgggattac	aggcgtcac	caccatgcct	agctaatattt	tatagttttt	agtagagatg	129120
gggtttcatc	atgttggcca	ggctggtctt	gaactcctgg	tctcaagtga	tccgtctgcc	129180
tcggcctcct	agagtgtcga	gattacaggt	gtaagccact	gcacccagcc	ttatgcatta	129240
taattttta	ttgtaaactg	tacaaaaggga	taatacttgt	agtacaccaa	gaagtaaaaa	129300
catttggtat	aggtagttaa	catttgtaac	cagtagaatt	ataggtaaaa	tttatttatt	129360
taaaacagtt	ttagttggat	ttgatttcaa	ctttaaaata	atgcttttca	tctctatcag	129420
gtcttttttc	ctggcttttt	gtccagcaat	ctttattata	aatatttgaa	tgatctcatc	129480
cattcgggtc	gaggagatga	atttctgggc	gggaacgtgt	cgctgactgc	tcctggctct	129540
gttggccctc	ctgtatgagtc	tcacccaggg	agtctctgaca	gctctgcgtc	tcaggatttg	129600
actgattcgc	tctgccatta	gggagaaaag	catacacatc	ctttccttca	catccagta	129660
acagatccta	ttatttgtaa	attttaagtt	gtggaaaaaa	aagataaaaag	ccaggcacag	129720
tggcctgtgc	ctgtaatccc	agcactttgg	gaggtctcgg	tgggcggatc	acacgaggtc	129780
aggaaattcga	gaccagcctg	gccgacatgg	tgaaacccca	tctctactaa	aaatacaaaa	129840
attagccggg	catggtggca	ggcacctgta	atcctagcta	cttgggaggc	tgaggcagga	129900
gaatcgcttg	aacccaggag	gcagaggttg	caatgaacca	aaatcacgcc	actgcactcc	129960
agcctgggtg	acaaagttag	actgtgtctc	aaaaaaaaaa	aaaaaagaga	gaaataaaat	130020
tagcctactt	actatcttct	aatcaaagca	tttgtggtaa	cttaaaatat	actgtattgt	130080
aaagtatcat	gctgtttcat	ttaggccatt	attctatttg	aatctgtggc	tgtttctctt	130140
aataaatcaa	gtaatatgga	atatattcat	agcctctgaa	gagctcttta	tgtaagtatt	130200
tatttaggat	actttttgta	aaataagtga	atgaattctt	aggctctcctt	tttttttctt	130260
ttcttgagac	agggtctcct	cgtgcaacc	tggaaattct	gggtcctaat	aatccaccca	130320
ccacagcctc	ctgaatagct	gggactagag	gcatgcacca	ccacgcctgg	ctaatttgaa	130380
attttttttt	ggccaggcat	gatggttcac	gcctgtaatc	ccagcacttt	gggagaccga	130440
ggcaggcaga	tcacagagtc	gggagatgga	gaccagcctg	gccaacgtgg	tgaacccccg	130500
tctctactaa	aaatacaaaa	attagctggt	tatggtggct	catgcctgta	atcccagcta	130560
cttgggaggc	tgaggcagga	gaatggcttc	aaccaggagg	tcggagggtg	cagtgagccg	130620
agatcacgcc	actgcactcc	tgcattggtga	cagagttaga	ctccatctca	aaaaaaattt	130680
tttttttaaa	tgatggagtc	ttgctgtgtt	ctcaggctg	gtcttgaaac	cctgacctca	130740
aatgccgcct	gcttcagcct	aagtctcttt	tttttttgta	aagagacagg	gtcttgctat	130800
gttggccagg	gtagtctcaa	actcctggct	tcaagcagtc	ctccacactt	ggcctctcaa	130860
agtgtctggga	ttacagcgtg	gaaccactac	ctataatgtt	gtgtttcact	caaggccttt	130920
tgatttcggt	ttgcattacc	gtgccacatt	gtgcatttcc	ttgacctttt	ttgggttttt	130980
tggagtgcct	tcatatgtta	aaccatacct	gattctcctc	aaaatcacac	aaagtagaat	131040
atcctaagac	aagaaatcta	aggaggcata	aagaagttaa	ctggttttat	taaactcaca	131100

cagtaaatga	tagagccaga	aatattcccc	ttctagtgtt	cttcaccatc	agcttaaatgt	131160
agcataataa	tttttctaatt	actgttgaca	aataaataac	ccttttgaatt	ttcaataactg	131220
ggccttggat	aaattttccct	aattttgtaag	agagtattat	cgtatttgcca	tttacaaaagc	131280
tctcctgagt	atcttttttct	tctgttaagt	ttacctagga	gataaactgc	tgagtatggt	131340
tgccattttg	gtttttttgat	ataggttaga	atgtcttggt	tttttttttt	ttttttttttg	131400
gtttttgttg	ttgtcattgt	ttgagacagc	atcttgctct	gtcgcccagg	ctggagtgc	131460
atggcacgat	cgtggctcac	tgcaacctcc	acctcccggg	ttcaagcaat	tctcctgcct	131520
cagcttccctg	agtagctggg	attacaggca	tgtgcaacca	cacctgggcta	atttttgtgt	131580
ttttagtaga	gaaggggttt	caccatgttg	gtcaggctgg	tattgaactg	ctgacctcat	131640
gatccacctg	cctcggcctc	ccaaagtgtc	gggattgcag	gcatgagcca	ctgcacctgg	131700
ctgaatgtct	tggtttttgat	taggcactta	agaaaggcct	agggtactaac	cataaaaat	131760
atttttatac	cttttgttga	tactatata	atagaaaact	gcacttatca	taaccttaga	131820
caccttgaag	aatgttcaca	agcagaacta	acctatgtga	cccagcatcc	agatcaaaaa	131880
cagcattatc	agccccctcta	gaagccctct	tgggccccct	ccattcactg	tccttcttgt	131940
caccagggta	gtcattatcc	tgacttttga	tggcatagat	tagcattacc	tggtcttgtc	132000
attttataaa	taaaaccata	ctgtgtatcc	ttttcttgta	cagctttatt	gtgctaattc	132060
acattttacat	catacaattc	agtggttttt	atatgggtcac	agagtttaggt	aaccattacc	132120
acatcgatgt	tagaacattt	ttttcactcc	agatagaaac	cccctttact	taaaactcaa	132180
atcccccaact	ccaccagccc	taggcagcca	ctagtctact	ttttatctct	atagagacaa	132240
tagatttgcct	tattctggac	atttcataaa	catgggaaccg	tatatattgt	gggtctttgt	132300
tgccaactgt	ctttcactta	gcatcatgtg	ttcaaaagag	catcatgtta	tccatgtttg	132360
gcatgtatca	gaatttttatt	cctcattatg	gccaaatatc	ccattgcaag	gattttatgac	132420
attttattttg	aattgtaccc	tcctttctgc	catttatcaa	taatgctact	gtgaccttt	132480
gtgtacaagt	ttttgtgtgg	atacaggttt	tctttttgtt	tttaaatttg	agggtggagt	132540
ttgtctctgtc	gcccaggctg	gagtgcaagt	gcacaatctc	ggctcactgc	aacctctgtc	132600
tcctgggttgc	aagcagttct	cctgcctcag	cctcccaggt	atctgggact	ataggcacgc	132660
accaccacgc	ccagctaatt	ttttagtaga	catgggggtt	caccatgttg	gccagtctgg	132720
tctcgaactc	ttgacctcaa	gtgatccacc	catctcggcc	tcccaaagtg	ctgggattac	132780
agggtgtgagc	cactatgccc	ggctgtggtt	ttcatttctt	ttgttgtata	tacataggag	132840
tagaattgct	gagtcaagag	gtaactctta	aacttattga	aaaactgcca	gattgttttc	132900
cgaaaaggct	gcaccatttt	gcaatcccac	cagcagtgta	tgagttttac	agcttctcca	132960
catttccattg	gaacttatta	tctgtttggc	tgtttttaaa	aatgatagtc	attccaataa	133020
gttctacttc	agtgtgggtt	ttgcactctc	ctgatgagta	atgatgttga	gcactctttc	133080
atltgcttat	tggtctttgt	tctagctttg	gaaaaatgtt	tattcaaatc	ctttggccat	133140
ttttatttttt	atttttattt	atttattttt	ttttgagacc	aagtctcact	ctgtcagcca	133200
ggctggagta	caatgggtg	gtctcagctc	actgcaacct	ccgctcctg	tgttcaagt	133260
attctcctgc	ctcagcctcc	cgagttagctg	ggattacatt	tcaggcacct	gccagcatgc	133320
cgggtctgatt	tttgtatttt	tactagttag	agggtttcac	catgttagcc	aggctgtgca	133380
caaaactcctg	acctcaggtg	atctgcctgc	ctaggcttcc	caaagtgtg	ggattacagg	133440
cgtgagccat	tggtggccagc	ctagattttc	ttttttcttt	ttttttttga	gaaggagtct	133500
tgctcttgtt	gcccaggctg	gagtgcaatg	gcacaatctt	ggctcactgc	aacctctgcc	133560
tcctgggttc	aagcgatttt	cctgcctcag	cctcccaggt	agctgggatt	acagggtgct	133620
accaccacac	ccagctaact	tttgtatttt	ttttagagac	agggtttcac	catgttggcc	133680
aggctgggtct	caactcctga	cctcaggtga	tccacctgcc	ttggcctccc	gaagtgtctg	133740
gattaccggc	atgagctacc	aggcccagcc	aattttctca	ttatattgcc	caggctggtc	133800
tcaaaactcct	gggttcaagt	gatcctcctg	ccttgccctc	ccaaagtgtg	gggagtacag	133860
gcgtgagcca	ccttgctcag	cccctttgcc	catttttaaa	ttagattgcc	tttttatatt	133920
gagtttcagg	agtcctttat	atattctaga	taaatgtccc	ttatcaaatt	atattatttc	133980
caggtattttt	cttcattctg	tgagttgtct	ttctctacc	ttttaaaaaa	ggtgggtttt	134040
tggtttgtttg	ttgtttgttt	tttttaagat	aaggctcat	tctgctgccc	aggctggagt	134100
gcagtggcac	aatcacagct	cactgccacc	tcaacttctt	gggcgaagt	gatcctctta	134160
cttcagcctc	ctgaatagct	agggccatag	atacacacta	tcacacccag	cttttttttt	134220
ctgtttgttag	agacagatct	tactgtgttg	cccaagttgg	tctcaaaactc	taggctcaaa	134280
gtgattctcc	cacctctgcc	tcccagagt	ctgggattac	agggtgtgagc	cacacgcac	134340
ctgtcttttc	actattaata	gtgtcttctc	gcttcagcct	cccagtagtc	tgggattaca	134400
ggcaccaccc	accatgcctg	gctaattttt	ttgtattttt	agtagagaca	gtgtttcacc	134460
atgttcaccc	ggctgggtct	gaactcctga	cctcaggtga	ttcacctgcc	atggcctccc	134520
aaagtgtctgg	gattacaggc	gtgagccact	gcacccggcc	aaaatattgc	cttcttaaca	134580
gtatttgtctt	ctaatttgtg	aacatggatg	tatcttcatg	tatttatgtg	ttctttcatt	134640
tcagcagaat	tttgtagttt	tcagagttaga	agcctttcac	ctccttgggt	catttatctc	134700

tatgttttaa	gttcttttcg	attccattat	aaatagaatt	gttttcttaa	tttcattttc	134760
agattgtttg	atgagagagc	atagaaatac	aagtgttttt	tacatgttga	tcttgcaact	134820
tcaactttga	taaatctgat	tgtagctctc	aatagttttc	ttgtggattc	tttaggattt	134880
tcaatatata	agatcatgtc	atztatggat	agagatagtt	ttttttctgg	ctagaactta	134940
cagagcaatg	atgagtagaa	gtggcagaag	caaaaatctt	tgtcttggtt	cctatctgac	135000
agggaaaagct	ttcagtttca	tcatttaata	tgatgttagg	tgtgggtttt	caataaatgc	135060
cttttttcag	attcaggaat	ttccctatca	ttcctgattt	tttaaggctt	tttttttttt	135120
ttaaatcatg	aaaggggtgt	gaatattgtc	atgttctttc	tgatcagta	taaatgatcc	135180
tatggatttt	gggttttatt	ctgttgatgt	gaaatattaa	ttgattttca	gatgttaaac	135240
caaccttgca	tacctgagat	gaatctcact	tggtcatggt	gtataatctt	ttcaatatgc	135300
tgctggattc	catttactgg	tattttgttg	aagattttgt	atctgaacgc	ttaagataac	135360
atttacaactc	tatcagaaat	gaattgacca	tcaatgtgag	agtgtatttg	tgggttcttg	135420
attctcttcc	attccaaaga	tagacataca	tcctgtctgt	tgtctgtctt	tatgccagta	135480
ccataactctc	ttgattacta	ttgctttgtg	ataagttttg	aaatcagaaa	gtataaatgt	135540
gattttggta	ctcagtagaac	agtctcctca	gaattagtgt	ggaaatattc	cctctttatt	135600
ctgggtccctc	tttctttttt	gtttaactgt	gtatcttgga	gattgttctt	tctcaacaca	135660
tgagagccgc	tttccttacc	ctcccacccc	tgctatagag	aggtctataa	gtgtctgttc	135720
aattatttta	tttacttaac	ctattactta	gtcggggaca	ttaaagcttg	ttatgtcttt	135780
tattttaaac	aatgctgcag	tgaataatct	tgatatataag	tcattttcca	tcaatataag	135840
tctctctgta	actgaatttt	tagaagtgtg	atttctaggt	caacctatgg	ctctgtattt	135900
cacaaaaata	ccaattctgg	tttttcttgt	ggagggtggg	agtaggaggt	agaatgctgg	135960
aggagaactt	gctgtactca	gctggctagt	cattttagaa	aggtttctct	agcttctttt	136020
tgtcatatgg	cctcaccaag	aatcaaaaac	attcctattt	accctgtaaa	catgggggct	136080
tactacccaa	gatacatatt	ctggatgta	tgacagcttt	tcataatgaa	gaaataatgc	136140
tgtgagtaca	gcacatttgt	tggaacttag	gtcgttaaga	atgtcttata	aattcataca	136200
ttatacattt	tatttttatt	tatttttttag	tttttgatac	agagtcttcc	tctgtcgcct	136260
aggccagcgt	gcagtgtgtc	aatcttggct	cactgcgacc	tccatctcct	gggtcctcct	136320
gattctcatg	tctcagcctc	cagagttagct	atgggttacag	gcatgcacca	ccatgcccgg	136380
ctaatttttt	tatttttagt	agaaactggg	tttcaccata	ttgaccatgc	tggcctcgaa	136440
ctcttggcct	caagtgtatc	gcctgcctca	gcctcccaaa	gtgctgggat	ccttgtattg	136500
ggtaaaaagat	gaatatttgag	ggctgcatgg	tggtctatac	ctgtaatccc	agcactttct	136560
gagactgagg	tgggaggagt	cctggagccc	aggagggtga	ggctgcagtg	agttgtgatc	136620
gcgccattgc	acttcaacct	ggctctcagtc	gaatttcagtc	actgtgcccg	gcatgtacat	136680
tttaaatattg	tgctttcctc	tttttagctat	agtatgaggt	tacatttcag	agtcatttgt	136740
gttaagcatc	ttaatagtga	tgagggttag	tgaaagttag	ttctatttca	aacactgaag	136800
aaaattttgt	acaaaactct	cacattccaa	gcccaggagt	gattgtttca	tatacttcta	136860
attttacaat	ttctattgta	gtccagtggt	aaaaaaagcca	gtattaaaaat	actgaaaaat	136920
tttgatgaag	cgataattgt	ggatgcggca	agtctggatc	cagaatcttt	atatcaacgg	136980
acatatgccg	ggtaagctta	gctcatgcct	agaattttta	caagtgtaaa	taactttgca	137040
tcttttaaat	tttttaatta	aatttttacat	ttttttctaa	tctattatta	tatgcccaga	137100
acttttactt	agagtgtgca	gtataatgtg	gtgggttaagt	ataaaaggctc	tggagtgtact	137160
tcttgggttt	taactttggc	tctgccattt	attggcagcc	gctaacctct	tggatctca	137220
gtttcttcat	ctgtaaaaatg	agaataataa	agtgaataa	tgccaacatc	atttactctg	137280
ggctgcataa	ctgatacttg	gaaaaagtat	tccttttagt	ttaaagaatta	agttgggtat	137340
tcatttttagc	ttgtataaaa	aagatagtga	ttcataggat	atgccactta	ctgaaattta	137400
ccacagatcc	aatcataaaa	tcactttctc	ttccctaaag	atagcttgat	taacatgtaa	137460
agggtgtgta	aggcttgatt	acactaccct	gatccgtacc	ccagtcccca	gcagcaccat	137520
gaaaaaggga	tttcaacata	tttaattact	ttcagtagaa	agtaacagtg	gtaggccagg	137580
cgcagtggct	cacacctgta	atcccagcac	tttgggaggc	cgaggtgggc	ggatcacgag	137640
gtcaggagat	tgagaccatc	ctggcttaaca	cgatgaaacc	ccgtctctac	taaaaataca	137700
aaaaattagc	cgggcatggg	ggcaggcacc	tgtagtccca	gctacttggg	aggctgagac	137760
aggagaatgg	cgtgagcccg	ggaggcggag	cctgtagtga	gcttagattg	tgccactgca	137820
ctccagcctg	cgcagtggag	cgagactctt	gtctcaaaaa	aaaagaaagt	aacagtggta	137880
ttgggagact	gaggagccta	gaaagtactt	gaaggaagta	aaaggtttgt	ttgaccacat	137940
tgtatttgga	aagccagctt	tttcagctgt	gtcagctttg	tgtagtgtat	tttagttctt	138000
cttttagaaa	ataacggaca	aggccgggca	cggtggctca	cgctgtaat	cccaccactt	138060
tgggaggccg	agacggggcg	attacctgat	ctcaggagtt	cgagaccagc	ctgggcaaca	138120
tgggtgaaacc	ccgtctctac	taaaaataca	aaagttagcc	gggctgggtg	gcgtgtgcct	138180
gtagtccag	ctactccgga	ggctgaggca	ggagaattgc	ttgaaccccg	gaggcggagg	138240
ttgcagttag	ccaagatcac	accattgcac	tgcagcctgc	gcgacagagt	aagactctgt	138300

100/122

ctcaaaaaat	aataataaaaa	taaaaaagaa	tgacacagtaa	acctaaatga	gttcattccc	138360
aaagatgatg	ttattcttaa	gggatgggtc	atttatattaa	gacctacat	aaagtctatc	138420
aattgcgtga	tttttcactt	ctgtaattgt	gtgtatgtat	aatgtaata	tatatgtttt	138480
tggtttgttt	tggttttttg	agacggagtc	tcgctctgtt	gctcaggctg	gaatgcagtg	138540
gtgcaatctc	agctctctgc	aaacctctgtc	tcccagggtc	aagcgtttct	tctgcctcat	138600
cctcccaagt	agctgggact	acaggcacgt	gccaccacgc	ccggctaatt	ttttgtat	138660
ttagtagaga	tggtgtttca	ccgtgttagc	caggatggtc	tcaatctcct	gacctcgtga	138720
tcaccccgcc	ttggctttcc	aaagtgttgc	tattacaggc	atgagccacc	acaccagca	138780
tgatattttt	aaatgtataa	aatgaagcag	aaaagagaaa	tgataatttt	tcttcactct	138840
gaaagattat	cttcaccagg	cgcagtggct	cacacttgta	atcccagcac	tttgggaggc	138900
ctcggcaggc	ggctcacttg	agttcgaaac	cagcctggcc	gacatgggtga	aactccgtct	138960
ctactaaaaa	taataaaata	aagatgggtt	taatatatgt	tttagtttta	tgatttttagc	139020
atctttctga	aatttttctc	aaggcaagta	aattttgtatc	agttgggtata	ttggtaccca	139080
tctatgaaat	aacttattag	gaagatatct	ctaaaaataag	atcactttgc	ctaaaaataa	139140
ctgatatatt	agttgtcaca	gaatttttct	tttaaccgac	ttgataaatg	cattattctt	139200
gacgtcaagt	gatccacctt	cctcagcctc	ccaaagtgtc	gggattacac	acatgagcca	139260
ccgcacctgg	cattattctt	ataaaaaggtt	aaatttctag	ttaaagttta	tgctctctt	139320
gttcattgtac	cattgcttat	ttctctccct	tcctactcac	agtaatcatt	cttatgggtat	139380
gcacttttgt	ttgcttattt	ttatgtaat	gatattacgc	tccattctgt	acgttggtact	139440
ttcattcaca	gtgagttttg	gacattccta	tgttcatcta	tacagactta	cttcatttta	139500
actacactgt	atgtattccgt	tactataact	tactataact	catcactgta	gcagagcatc	139560
tcatagtgta	tgtattactg	ttttgccatt	ttgggtacaa	tgagtattta	agtcatttgc	139620
agtttttccc	tcttatcccc	agtattacag	aggatctctt	tttatatgct	tctttgtacc	139680
aagaggcaga	tataaaaaat	tttttttgaa	aaaatttttg	aaaaaaaatg	aaatgaagtc	139740
tcactatggt	gccagggtg	gtctcaaaact	cctagggtca	agcaatcctt	ccatcttggtc	139800
ctcccaaagt	gctgggttta	caggcatgag	ccaccatgcc	tggtcctacat	tttaaatctt	139860
gatagctctt	acaatttact	ttgtaaaagta	tctgcacat	tttatgttct	caccagtctt	139920
taataagaat	acttcatact	tttggttgga	cacagtggct	cacgcctgta	atcccagcac	139980
tttgggaggc	cgaggcggtc	agatcaagag	atcgagacca	ccctggccaa	tatgggtgaa	140040
ccctgtctct	actaaaaata	caaaaattag	ctgggcgtgg	tggtgcaccc	gtagtccag	140100
ctactcgaga	ggctgagaca	ggagaatcac	ttgaaccggg	gaggtggagg	ttgcagtga	140160
cttagatcac	accactgcac	tccagcctag	caacagagtg	agactctgtc	tcaaaaaaaa	140220
aaaagaatac	ttcagactta	atttttttct	cagctcttaag	tggttgctaa	tgagattgag	140280
tttcttttgg	tatgtctctt	gattgttcag	gttttttctt	ttatgaattg	actgttcac	140340
tctttttcac	attatttctg	ttgggtgatt	ttattagtga	cttggtaaaa	ttctgtatat	140400
tttttcagca	tgacacttca	ttattcaaaa	aaaaaaaag	attctctatg	tttctcgata	140460
ctaatacttg	gttggttaata	ccttaaaaat	aagaccctta	ctgtattttt	tgcttttttt	140520
tttttttttt	tttttttttt	tttgagatag	agtcttgctc	tggtgcccag	gctggagtgc	140580
aatggatga	tctcggctct	cagctcactg	caactgcaac	ctctacctcc	ctgtttcaag	140640
caattctcct	gccttagcct	cccaagtagc	tggtgattaca	ggcatccacc	accacaccca	140700
gctaattttt	gtatttttag	tagagacagg	gtttcaccat	gttggtccagg	ctggtctcaa	140760
actactggcc	tcaagtgtac	cgcctgcctc	ggcatcccaa	agtactggga	ttacaggcat	140820
gagccacagt	gcctagccac	tttttgcttt	tttaactttgt	tttatagtac	tatagtttta	140880
gtataaacag	atgtatgtat	acacacaact	atggctttat	aatatgtttc	agtcatttgt	140940
agagcaaggc	ctaccttttg	ggtgcttctt	ttacaaaatt	gtcttggtta	ttctgtgccc	141000
ttttttctta	tttgtgaatt	ttagaattgt	gaattacctg	ttgactcacc	atgttttgta	141060
aactgaggat	ttgaaatgga	attgcactca	attaaagatt	atcttgcttt	ctgtgcagca	141120
atgttttatt	tcaataaatc	cctactttta	attacttagg	atagctataa	attgtgtttc	141180
tggttttcta	gatttagatg	aaacgcttta	aattgattgt	tttctcctaa	atttaaaact	141240
gattgttaga	agttaaaagt	ttctgttcat	tcttatttag	gaagatgaca	tttggaagag	141300
tcagtacttt	ggggcaattc	atccgagaat	ctgagcctga	acctgatgta	aggaaatcaa	141360
aagggtttgtg	gtgtttttat	acttcataat	aagcctttac	tcacattagt	gattgactgt	141420
aagtcaaaga	ccacttaagg	tttaaaactgt	ttattttgta	aagtaaccac	tgatcttttc	141480
acctgtgtgt	tatagtccga	agtaagtaca	agggcttctc	gtagtacacat	ctttatgcaa	141540
tctcctctga	atcaaaagtt	agtgaacttg	ctttgccact	ccagaaggca	catgaatatg	141600
aaaaagcatt	gtctattttc	ttatttaagt	gcaaaaatacc	cgacctaaagt	tggtacttaat	141660
gtttgagacc	ttttatttta	ttaaattata	tttttctctc	tttctttttt	ttttttgaga	141720
cagttcttgc	tctgtcacc	agaccggagt	gcagtgtctc	gaccgcacct	cactgcaacc	141780
tctgcttctc	aggttcaagc	gatttttctg	cctcatctc	ctgagttagt	gggactacaa	141840
gtgcgcacca	ccacacctgg	ctaatttttg	tatttttagc	agagatgagg	tttcaccacg	141900

101/122

ttggctaggc	tgggtctcata	ctcctgacct	caagcaatcc	atccgccttg	gcttcccaaa	141960
gtgctgggat	tacaagtgtg	agccaccatg	cctggcctta	ttaaattatt	tttattaaat	142020
ttcctcaaga	ttgatgaaag	taatgaaata	taaaagtaat	gaaatatatg	tggaaaaatag	142080
actggattaa	gaaaaatgtg	cacatataca	ccatggatac	tatgcagcca	taaaaaagga	142140
tgagttcatg	tcctttgtag	ggacatggat	gaagctggaa	accatcattc	tgagcaaat	142200
gtctcaagg	tagaaaacca	aacaccgcat	gctctcactc	ataggtggga	attgaacaat	142260
gagaacactt	ggacacaggg	tggggaacat	cacacgctgg	ggcctgtcgt	ggggtggggg	142320
gctgggggag	gaatagcatt	aggagatata	cctaataata	atgacgagtt	aatgggtgca	142380
gcacaccaac	atggtacatg	tatacatatg	taacaaagct	gcacgttgtg	cacatgtacc	142440
ctagaactta	aagtataata	aatttaaaaa	aaataaatat	atgtggaaaa	tattaatagg	142500
tcaaaattca	aattgttcat	ttaatcagaa	gagtagttta	gtcaaatcca	aggggttagac	142560
aacagaaatc	ttttttgtca	agtgcattct	ttgtgactga	tttcattttc	ttcctgggtt	142620
acacaggaag	atttcagaaa	caaatgtgga	tcctgtgacag	atgggtatcta	gaagttttta	142680
gtttgggtga	attgacagta	ttttattgag	taaaagatac	taatttttgt	aagaagaaaa	142740
attcaatttt	gataagtatg	tttaagatta	agagctattg	gccaggcgct	gtggctcatg	142800
cctgtaatcc	tagcactttg	ggaagctgga	gcaggtgggt	cacgaggtca	agagattgag	142860
accatcctgg	ccaacatggt	gaaaccctgt	ctctactaaa	ttagccaggc	gtggtggcac	142920
atgctctgtc	accgcctcc	gggtttaagc	gatcctactg	cctcaggctc	ctgagtagct	142980
gggattacag	gcgccatggc	taatttttgc	atttttagta	gagacagggg	ttcactacat	143040
tggccaggct	gggtctggtc	caaactcctg	acctcagggt	atctgcccgc	cttagcctcc	143100
caaatgtcgt	ggattacagg	catgattcac	catgtctggc	catttatctt	attttctttt	143160
tttttttttt	ttttgtttga	gacggagtct	tgctgtgtcg	cccagagctg	gagtgcattg	143220
gtgcatctc	agctcactgc	aacctctgcc	tcctgggttc	aagcaattct	cctgcctcag	143280
ttttccaagt	agctgggatt	acaggcgctg	gccaccacat	ctagctaatt	tttgtatttt	143340
tagtagagac	aggggtttcac	catgttggcc	aggctgggtc	cggaactcct	gacctcgtaa	143400
cttgcaccac	tcggcctccc	aaagtgtgta	gattacaagt	gtgagccact	gtgcccagcc	143460
atcttatttt	ctttcttttt	ttttgtcggg	tgggaggggg	acagagtcta	gctctgtcgc	143520
caggcttggc	tcactgcaac	ctctgcccc	caggttctag	caattattct	gcctcagcct	143580
cccaagtagc	tgggattata	ggcacctgcc	accacgcctg	gctaattttt	tggtattttt	143640
agtagagatg	gggttttgct	atgttgacca	tgctggcctc	aagtgtatccg	cccaccttgg	143700
cctcccaaag	tactgggctt	acaggcggtg	gcttgtattg	ggtaaaagaa	caatattggg	143760
ggctgcattg	tgggttcatac	ctgtaatctg	agcactttgt	gagactgaga	tgggaaggagt	143820
gttggagccc	aggaggggtg	ggctgcggct	gcagtgaatt	gtgatcacgc	cattgcactt	143880
ccacctaggt	aatggagcaa	gacctgtctc	ctaaaaaaca	aaacacaatt	tttttaagga	143940
atactgggaa	gaggtcagtg	gtggttttag	aacagaggaa	gtgccagatg	accttttgtg	144000
ggcatttggc	aggaagaact	ctacagtgtc	tttaggtagc	ttctgtccat	aaggataaat	144060
gggtctctct	cccagtatata	atagaaaatc	tctgagctgt	tttttttgt	ttgtttgttt	144120
tgtttttttt	tctgtagatg	gagtcctctc	ctgtcggcca	ggctggagtg	ctgtggcgcg	144180
atcttggctc	actgcaagct	ctgcctccca	ggttcacacc	attctcctgc	ctcagcctcc	144240
caagtagctg	ggactacagg	tgtccaccac	cacgcccagc	taattttttg	ttatttttag	144300
tagagatggg	gtttcaccat	gtcagccagg	atgggtctcg	tctcctgacc	tcgtgatccg	144360
ctcgccctct	ccttgcaaag	tgctggagtt	acaggcggtg	gccaccgtgc	ctggcctggg	144420
ttttttgttg	ttgttattta	tttatttatt	tatttatttt	tgagacaga	ctctcgctct	144480
gtcgcccggt	ctggagtgtg	gtggcacgat	gtcggtctac	tgcaagctct	gcctgccagg	144540
ttcaagccat	tctcctgcct	cagcctcctg	agttagcagg	accacaggcg	ctcgccacca	144600
cgcccggtcta	attttttgta	tttttagaag	agacgggggt	tcaccgcatt	agccaggatg	144660
gtctcgatct	cctgatgtcg	tgatccgccc	acctcgccct	cccaaagtgc	tgggattaca	144720
ggtgtgagcc	accgtgcctg	gcctgatttt	tttttttttt	taatctgggtc	tcatacctct	144780
gacagctcat	gaagaagtgc	tcctgcttca	tatgtatatg	tggttagcata	gtgttaacat	144840
agcataggtg	ttcgggtgtt	gcagtttctg	ttgtttttat	atgaattaa	gtgtattatg	144900
agcagttgaa	gatataatag	aaattttttc	ccaaaccact	atctctgctc	gttctattca	144960
ttcagctctgt	ttatgttatt	ccttcattca	ttcattttat	agaacagtgg	agtgccctact	145020
gtatgcattc	attgttctgg	gtcctgggga	agaaaaacaa	gttcctgctt	tcattggaact	145080
tacattatat	tggcggagac	agtaacagac	aaacaaatgt	agcctgtgta	catgtgttac	145140
atgaaaagca	gggttagggg	ctgggagaga	gtagtaggga	gtgctatttt	cgaggtgggt	145200
gtcaggaaag	gcctcactga	ggaggtggca	ttttgagtag	acctgagcgc	agcggggggc	145260
taagccccag	cagcatgtgg	aggaagagtg	ttcttgggtg	aaggaaacaag	gatagaggcc	145320
cgaagctaga	gagctcagca	tgatcaagga	acagcaagcc	ccgtgtggct	ggaatggagt	145380
gagcaaaagga	atgagcagta	gaaggtgagt	gagttgggag	gtcaccagag	accatggcaa	145440
ggacttgaaa	gtgtcaggga	cacattggaa	gttgagagag	ggaaatgatg	ggatttatgt	145500

ttttatgttt	agtgttttta	agggattgct	ctatcagcta	tttgaaaaat	145560
gcttcaagaa	gagaagcaga	gaaacaacat	tcttgccata	gtcatagtct	145620
tgatgggtgt	gtggattagg	ctggtagtgg	aagaccagtc	cagttcgggt	145680
ggtagaggca	aaaagattat	atttctacca	gcaagcccat	ctatgaagtt	145740
ttaatTTaat	tgagacatgc	ccacataaac	taataaatag	gaatttctgc	145800
aacaccctcg	tatatcctgg	ttcttctttt	agttgtccag	atgtctcttt	145860
ttttttggtg	gtgtaggagc	ctagagattg	aatttattca	cccaaaaggc	145920
ttactatgtg	ccaggcacta	tgctgaatgc	caaggatgta	aataagaggg	145980
gtctgtttta	ctccagcttg	gttccctttt	aatgaccctg	acttggttaag	146040
atcctacaga	atgttttaatc	ttctgtactt	tcctggttgt	gttatttagc	146100
ttccttgaca	tttcttgtaa	actggaagtt	acacctatag	tcttgatgat	146160
catttttagat	tagaacacat	catgtgttgt	atatgggtgt	tttgaaagcc	146220
ttggctctgta	cattaaaatg	ttgcctgaat	ggatacacat	aaaatttaac	146280
ttagagatga	gaagaaagag	gtgcctttta	cttttcaata	taccttttcc	146340
gaactttctt	gccctatgca	tacgttatgt	cttaatcatc	cacctcatct	146400
ggctttctgt	tgcatttgga	atgaaatcta	gcctctttgc	tggtacctgt	146460
tgctggcctc	tatcacctta	ctttgaacca	ctcctttcat	ggactgagct	146520
tatcttttat	tcttttgctg	aagtttcttc	actttgagtg	cctctgcagt	146580
tggtgtgggc	aagccctgcc	atggctttca	tgcaaggatg	gttccctcct	146640
tattatctct	tcagagaggg	accttcccaa	ctccgatgat	ctaaaatcct	146700
cactcactac	cacttctttc	ttttcttttc	cttttatctt	tttttttttt	146760
gagatagggt	cttgctctgt	tgcccaggct	ggaatcacga	ctcactgcag	146820
ttgggtctcaa	atgatcctct	cacctcagcc	tctcgagttag	ctggaactgc	146880
caccatactt	ggcttattat	tttacttttt	gtagagacag	ggtttcacca	146940
caagctcctg	ccgcaagcaa	tccacatctc	tcagcctccc	aaagtattgg	147000
gtgagccact	actcctggcc	tattttctta	ttcactgtct	aaaattatct	147060
tttacatact	tgttttatagc	ttatttctca	gctggacatg	gtgcctcaca	147120
caatactttg	ggaggctggg	ttggagaatt	ggttgagccc	aggacttcaa	147180
ggcaacaaaag	tgagaccctg	tctataaaaa	attgtttaaa	aattagctgg	147240
acatgcctgt	ggtcccagct	acttggggagg	cagaggtggg	agaatcgctt	147300
ggttgaggcg	acggtgagcc	atgattgtgc	cactgcactc	tagcctagtg	147360
accatgtgtc	taaaaagtaa	ataaaaaatag	tttctctttc	atgactagaa	147420
atgtggggcag	ggagtttgct	tatactattt	ggcactatat	ttcctgatte	147480
ctagcacat	ggtaagtact	ccttaaatat	ttattgactg	aattatttaa	147540
tttcatTTtg	gattatctga	gtggtaagat	tacggattat	atTTatgtaa	147600
tttttttaaac	ttggttgccc	tttgccacac	tgacatagac	actaagtttt	147660
ttacttccga	ggatactcac	agaggccatt	ctcttctcaa	tccccaaata	147720
cttagcactt	tcaagctaatt	gcaattctta	gatgatgtat	ctgtgtatat	147780
ctctacaaat	gtagaaattg	aagtctgggc	acagtggctc	tcacctgtaa	147840
ctggggaggcc	aaggcgagcg	gatcactgag	gacaagagtt	aagaccagcc	147900
gttaaagcct	tgccctctatt	aaaaatacaa	caattagggc	cgggcgtggt	147960
ataaatccca	gcacgttggg	aggccaaggc	aggcagatca	cgaggtcagg	148020
atcctctggct	aacacagtga	aaccccatct	ctactaaaaa	tacaaaaaat	148080
gggtggcacg	cgcttgtagt	cccagctatc	gggaggctga	ggcagggtgaa	148140
cggggaggcg	gaggttgcaa	tgagctgaga	ttgcaccgct	gaactccagc	148200
jagggagact	ctgtctcaaa	aaaaaaaaaa	aaaaacaatt	agccaggcgt	148260
icgagtacct	gtaatcccag	ctactaggga	ggctgaggga	ggagaatcac	148320
jaggtggagt	ttgcagcggg	ctgataatgc	accactacat	tccagcctgg	148380
jagactctgt	cttaaaaaaa	aaaaaaagaa	agaaagaaat	tgaggaaatgt	148440
jtctgtgatt	tgtttaggaat	cacacagcag	gttagtagca	actacagggc	148500
ataaccacct	tgacaatggt	ttgtttacag	ttcggctccc	cttccctctgc	148560
tccttatttg	agggcagctg	gaaagaattt	tcatcattta	ctagcctata	148620
jagttttgaa	accttgataa	tagagcacag	aggaaaagac	tgagttttct	148680
agtcttgct	ctatggccca	ggctggagtg	cagtgaaccc	atctcagctg	148740
tgccctccca	ggttcaagca	attctgcctc	agcctctcga	gtagctgaga	148800
jtgtcaccac	gcccagctaa	ttttctgttt	ttgtttcggt	ttgttttttt	148860
jtcttgctct	gtcaccaggg	ctggagtgca	gtgggtgcag	gttggctcac	148920
jtctctggg	ttcaagcaat	tcttctgcct	cagcctcccc	agtagctggg	148980
gtgccacca	tccctagtgc	atttttgtat	gttttagtaga	gatgggggtt	149040
icaggctgg	tctcgaactc	ctgatctcag	gtgatctact	cgtctcagtt	149100

103/122

tcccaaagtg	ctgggattat	tggcacacgc	ctatTTTTgt	atttttagta	gagacggggg	149160
ttcaccatgt	tggttagact	ggtctcaaac	ttctgacctc	aagtgatttg	cccggccccg	149220
cctcccaaag	tgctgggatt	acaggcgtga	gccaccgtgc	ccagccaaga	ttgagttttg	149280
aaaagagcct	tctgagatta	tgagaagggc	aagcaagata	acttaagaag	ttacattaaa	149340
atcatctaag	agacagtgtg	acaagaagga	attgtaaaat	gatgttatga	gcacgtgccc	149400
aatgtagtgg	caatcccttg	tgcttcgata	cattgggtgg	agacaaaact	gtactttaat	149460
tgataaatcc	cttacatgtc	attttaagga	gcttagactg	actcccatca	tgtagacatc	149520
agagatttct	tttttttttt	tttttttttt	tttttttttt	tttgtgacag	agttttgtct	149580
ttgttgccga	ggctggagtg	caatggcgtg	atctcggttc	accacaacct	ccacctccca	149640
ggttcaagca	atttctctgc	ctcagcctcc	cgagttagctg	ggattacagc	catgcaccac	149700
cacgcctggc	taatttttga	tttttagtag	agacgggggt	tctccatgtt	gtggctggct	149760
tcgaactcct	gacctcagg	gatcctcccg	cctcagccac	ccaaaagtct	gaaattacag	149820
gcgtgagcca	ccgcgcccg	cccagagatt	tctaaacaga	gttctaacca	gatgcttttc	149880
cctgtcagta	gaattgagaat	gaattggagg	tgggagagac	tggcatgagg	gacaccagtc	149940
agccagtggg	aatgttgata	aatgttgata	ggagaagaaa	aagattcaaa	gttaggtagt	150000
ggtagcaaga	attagaggga	aggtcggatt	tatgatattg	ccaaggttga	attctaaggt	150060
gaaatttggt	ggcagatttc	atgtgtaaat	tgggaaggta	gattgagttt	ttttaacatg	150120
ggttttctaa	catgtcaata	gagtactctc	gcaggggggg	ctgacgagag	aacagtgcac	150180
ggggtgattc	aacagccagt	tgagccttca	tgacagagcat	ttaacactgt	gactctgtag	150240
actctgggtg	gcagtataat	ttcattaaac	caatatattaa	acccttaggt	aataataaaa	150300
attgagggaa	aaggatccag	gttttgattt	ttttatgaat	tcagttattg	aattaaacag	150360
gaccttgctc	caagaataaa	tctaccaaca	attaacttgt	tttaaagcaa	agttaggaag	150420
tgagcatgtt	caaattatta	aataaaaaag	taagctgtgt	atttcattca	tagaaataga	150480
ggctggccta	cttcggatga	ttctcagcat	gtgattacag	atgtgggctt	atacatccta	150540
gggagttaag	gcgtactctg	gcttggatag	agtagagctc	tttgaaactc	ttctctcacc	150600
cagctagtgt	atatagacta	gagaactaga	atgtagcagc	atactctgtc	ttagaagccc	150660
ttttatatag	gagctgggtc	aaaacataac	taagtgggtt	aaatgtgttg	gtgtctccca	150720
atgtattgct	agattcttac	ccaagagcat	tatcctggtt	aggggtttgg	ttgggtttgt	150780
tttggttttt	aatgtttgac	acaaactaac	actagatgtt	agttctttca	tcaagtgagg	150840
agagtggaag	aaaagtccag	aactctgaaa	caccttttca	aaagtttttc	aagccatgat	150900
gtttgcaagt	taaatgctct	gttatgtaag	caatataatc	agtttttatt	aatgtaacat	150960
tccttagtgt	tttgggggat	cacacaaaaa	agaatatcca	tatctggaag	caacagcttt	151020
taaatagaag	cattgtggtg	gtgggtggta	ttttgttttt	ttttgttttt	tttgagttgg	151080
agtctcgctc	tggtgcccag	gttgaggtgc	agtggcacga	tctcagctcg	cttcaacctc	151140
tgctcccagg	ttcaagcaat	tcttctgcct	cagcctcctg	agtagctggg	attataggca	151200
cctgtaccac	tgctcggctg	atttttatta	tagtggtaga	gacaggtttc	accatgttgg	151260
ccaggctggg	cttgaaactc	taacctcagg	tgaaatcacc	acctcggcct	cccaaagtgc	151320
tgggaattaca	ggcatgaacc	accatggcca	gccaaataag	agcattttta	atgtaaaatt	151380
atgcattgaaa	tgtacattca	attttgtcct	tgtttactag	gatccatgtt	ctcacaagct	151440
atgaagaaat	gggtgcaagg	aaatactgat	gaggtaaatc	ctacctttag	gataaaaaga	151500
tttctgttta	taagtgccac	cctcatgtaa	gtgaggttta	aaattttcct	tttcttttag	151560
tcccatgttt	aagcagcatg	gcacatttat	gttctcttac	ccagaatgta	ccaagaaagg	151620
gtgggtccctt	cttaacatct	aacaattgcc	tggtagttag	agtgaaggta	tcttcagtca	151680
gaggctagga	ccactgaagg	atatacatgc	attcaagttt	ccatcagcca	gcaggcatca	151740
gtaatcagtg	tgtagatcaa	aagctcaaat	gtttccttcc	ccactggcag	ttttacttca	151800
agtagtggag	gcttgctttt	ttaatagtta	attaagtaca	ttgagagatg	ggaggtgaaa	151860
aaaggaaaaa	gttttatttt	gaccatctaa	tatgaaagta	gttcggtgtt	aggtatccag	151920
tagttgacac	tggaagacag	ggaatgacat	gttaatatct	atagccagag	ggtggcccag	151980
gttttttcgt	acatgggaat	gaaattctta	tccaaataag	tagaaattat	gtgcgtaaag	152040
catttggttaa	gagcactgag	tatgtgcac	tcgatccatc	taatgaataa	ccattatcac	152100
cagtttaaat	tattttcttt	aggcccagga	agagctagct	tggaagattg	ctaaaatgat	152160
agtcagtgc	attatgcagc	aggctcagta	tgatcaaccg	ttagagaaat	ctacaaaggt	152220
aaggatgact	tcgtttttgt	taaaactaaaa	agtattattt	tccaggtgta	aaaaataaaa	152280
agaacataag	gggtttcttt	gcctttgaag	gatttaactgc	tggtgggatt	accttcttat	152340
cataagcaac	tagaaaattg	acaaactaaa	tgaacaactc	gtttgcatat	attggacaat	152400
gggcaataca	gggaaacat	ggaaacaaaa	cagagcccag	tagtcttgct	gaacgaaaga	152460
gttaaatatc	aaagtccagg	ccaggtgcag	ctgtaatccc	agcactttgg	agcactttgg	152520
gaggccaagg	cgggtgaatc	acttgaggtc	aggagttcaa	gaccagcctg	gccaacatgg	152580
tgaacacctg	tcttagccgg	gtgtgggtgg	aggcacctgt	aatcccaact	atttgggagg	152640
ctgaggcagg	agaatcgctt	gaaccaggga	ggcggagggt	gcagttagcc	gagatcacac	152700

104/122

cactgcactc	cagcctgggc	gacgagcgaa	accccatctc	aaaaaaaaaa	tcaaagttca	152760
gagagctcaa	tttgagtaga	agttgtagga	taaggtagca	gaaaagagga	agctgcccag	152820
aaagaaagcc	gtagagatat	tttagagagat	tcccatggat	ccttgcccta	ggagtgatct	152880
gtatatgtgt	ggggtgaaaa	cgcatgtgtc	caggtagaga	acccccaga	aattagtagg	152940
ctgaatgatt	gctggaacat	agggctaaga	aaagtctatg	gccagaagga	tctggccaga	153000
gtagagagac	ttagtataac	acaaggcatt	gggtagtgtc	ttcacagagg	ttatgcctta	153060
ctactgaaga	taaattagtc	ctagagtaca	agcacctgaa	ccaagtttca	aagcaaat	153120
ttaaagggtc	aaattaccta	acaactgcat	gccaaaacaa	aggcctaacc	ctctttacag	153180
taacacaaca	aaattcagca	cttcacagtg	taaagttaga	atgtctgacg	tccaggctgg	153240
gcgcagtgcc	tcatgcctgt	aatcccagca	ctttgggagg	ccgaggcagg	tagatgacct	153300
gaggtcagga	gttcaagacc	agcctggcta	acatggtgca	accccgctc	tattaaaaat	153360
acaaaaactt	agccaggcat	gggtggccggc	acctgtgac	ccggctactt	gggaggctga	153420
ggcaggagaa	ttgcctgaac	ccaggagggtg	aagggtgcag	tgagccgaga	tcgcaccact	153480
gcactctggt	ctggggcaaaa	agagcaaaac	tcagggtcaa	aaaaaaaaaa	gaatgtctga	153540
cgtaactcac	aaattaccaa	gcatgacatg	aaagtgtact	ataaccagga	gaaaaactca	153600
tctatagaaa	cagacccaga	tgtagagaaag	atgatgaatt	tagcagacaa	agaccatcaa	153660
gtggctattt	taaatattaa	aaatatgttc	aagtggccag	gtgcagtggc	tcatgcctgt	153720
aatcccagca	ctttgggagg	ccaagggtggg	taggagttca	agaccagctt	ggccaatatg	153780
gtgaaacccc	ttctctacta	aaaatacaaaa	aaaattagct	gggcatgggtg	gcagggtgcct	153840
atagtcccag	ctatatggga	ggctgaggca	caagaatcac	ttgaacccgg	gaggtggagg	153900
ttgaggttgc	agtaagccga	gattgtgccca	cttgtactcc	agcctggaca	acagagtggag	153960
actctgtctc	aaaaaaaaaa	aaaaaaaaagt	taaagaaaac	aagagtataa	tgagaaaaat	154020
gcaaaatagt	tttaaaagaa	ccaaatggaa	tttcttaaaa	taaaaaatac	cagaaatggg	154080
ggccgggctg	ggtagctcac	gtctataatc	ccagcacttt	gtgggggctg	aggcaggcag	154140
atcacctgag	atcggtagtt	caaggccagc	ctgaccaaca	tggagaaacc	tcatctctac	154200
taaaaataca	aaattagctg	ggcgtggtgg	cgcattgcct	gtaatcccag	ctacttggga	154260
ggctgaggca	ggagaattgc	ttgaacccgg	gaggcagagg	ttgcgggtgag	ctgagattgc	154320
accagtgcac	tccagcttgg	gccacaagag	tgaaactccg	tctcaaaaaa	aaaacaaaaa	154380
aaaacagtag	actogaagaa	ctagctgagt	ttttctttac	tttaggcagt	aagtgtgacc	154440
ttttgcaggt	gactacttta	gttctctcatg	tctctattag	tagatcagag	aaattcgaca	154500
ccaaaacccc	aaaagaaaaa	ccccttctaa	tcctcattcc	atgattttat	gaatgcatga	154560
agtcctaggc	ctgcgaagga	atactcatte	tctttatcct	gtgttgatac	ctctctgctt	154620
caacctccaa	ctcgacattt	gcctatagga	tgtacttggg	cattcagcat	aaactacctc	154680
acaccattac	tgaattgctt	catgtgcaca	tgtcccattg	cacaataacc	gggaccttgt	154740
cttcctgtat	atgtgtccgc	agtgtgtgtg	ctacaggagg	gagtcagtga	atgtctgcac	154800
gtgtgtcttt	accatccctc	ttgaatatgc	tctagggtta	attcctagaa	gtagaattac	154860
tctattgaaa	attggcaata	tttttctatt	taatatctat	tgccaacatg	ggaaagcaag	154920
tctggatgcc	agtccttgtt	atatgcccct	tgggtaagtt	acgtaacctc	tttaagcttc	154980
tgttcactca	tattttaaca	aggaaaatta	caatatttta	cctcacaaaa	ttgtagttag	155040
cttctggctg	tcttaaaact	tgggtatatag	taaacactaa	gtgttgggtg	ccatccttaa	155100
tttgtaataa	taggtcactt	gttagagaaa	tgcaccttac	cattttcttt	tcttttcttt	155160
tttcagttat	gactcaaaac	ttgagataaa	ggaaatctgc	ttgtgaaaaa	taagagaact	155220
tttttccttt	ggttggattc	ttcaacacag	ccaatgaaaa	cagcactata	tttctgatct	155280
gtcactgttg	tttccaggag	agaatgggag	acaatcctag	acttccacca	taatgcagtt	155340
acctgtaggc	ataattgatg	cacatgatgt	tcacacagtg	agagtcttaa	agatacaaaa	155400
tggtatttgt	tacattacta	gaaaattatt	agttttccaa	tggcaataac	ccatttatga	155460
gagtgtttta	gcctactgga	atagacaggg	accacatcct	ctgggaagca	gataagcata	155520
gaactgatac	ttgatgcaca	ctcgtagtgg	taactcatcc	ctaactcagca	ttgtaaaagca	155580
gggtgccagag	gtggtttgct	ttgtccttcc	aaagcagggtg	agtcagcccc	accgagagcc	155640
aggcagcttt	gagtggcagc	gtggtgtctag	cagcttcagc	ggaacagggt	gagagttaat	155700
tatgcagtct	tcttgacagc	ggcattaat	tgggaaggaaa	ctgacaagtc	atgggtcaag	155760
tttcagtgcac	ttctccttcc	ctctgatggc	agtatatagt	tttcacattt	taattcctcc	155820
tcttgagatg	cactataact	aaaaccattc	tctcccctgc	taacagaagg	gtgtgaatct	155880
gggttacttt	gagcatattg	atgtgcccct	ttggaattct	gcactccagt	tacttaactt	155940
tcccttcaga	atcatgtgg	aaagaaagaa	agaaatagcg	atgactccac	ttttgcccct	156000
gtggcacctt	gaacaaagca	gttcttccca	aattataact	tttttttttt	taataaaggt	156060
gagcaggatg	actggggaga	gagaaacatt	tgactttgac	tgccctcccc	attctttgtc	156120
gtgagctgga	aagtgtgcag	ttggtcgtct	ttcttctcct	ttcttttagga	tagtaagaga	156180
ctcactcact	gcacttctgc	tcagttggct	tctgcacg	gatcacacag	ccatcagcag	156240
gactgcccag	ttggtgagca	cactccattg	accacgcggc	gccagcgctt	cctcaatgca	156300

105/122

catgattgag	aggaaagaaa	gttctcttag	atgttactgc	ttttgctcag	actttgcaaa	156360
aaaaaaaaata	tatatatata	tgtataaata	tataattatt	aatcactttt	gtccttgaga	156420
aagtccttgaa	tgaacagaga	atttattcca	ttgcaatatt	tgattgtata	gaggcacact	156480
gtttcatcga	cagaagaagc	aaaaaggcct	tgtgtaagtt	tttggtagta	tgtaccacct	156540
ctgttattct	tttaaagctg	aagtattcat	gtacttaaac	catattatat	ttaattgtgt	156600
ttgatttttaa	aatatatata	tatgaattct	atttaaaatt	gtgtcaactt	tctgctttca	156660
gggcatttat	ggctcttctg	ttgaaatata	ttgatctttc	caaataattt	catttgcttt	156720
ctaaaaaccc	agaacatgag	ccactactgg	actttgcctt	gtgtttgaag	tgtatggcat	156780
aaacccaagg	tttttattag	tcactctatg	tgtgattaat	tcatttttgt	cttttaacaa	156840
aatatttcca	tccacttcac	attgcttcaa	tccttaacag	aaaagcaata	taaaggttat	156900
agaataaaat	gtggtttttg	gcaactcttg	ctgcctctgc	atgttttgga	ataacaattt	156960
ctacaagact	ctaggctgtt	taaactagt	cttcagttta	agataaaatt	taatcatttc	157020
tttgatatata	cattttgtgc	ttctgagcta	gagatgccaa	gtagttgtaa	actgcttata	157080
aagagaatag	cagcaaat	gagactcggc	tacttttttc	tgccccacct	gctttgagac	157140
acagaagcgg	agtgtggccc	gaaattat	gccagattta	atatttgatc	taaagtaggt	157200
ccttgtagctc	attttaaagt	tggaaattga	ttcctccaac	attgagcacc	caccatgttc	157260
caggctctgt	gcattgtgcc	cacaaaataa	gattccctgg	tggagttttt	atgggttcaa	157320
ataatcagtt	gaacacccct	catctttatc	atgttgttga	cattgacaca	aattgtttta	157380
aaagaaaaga	tattagagag	aaagtgttac	ctttgtaact	tgatgtgtct	tcattcattcg	157440
gtaagatttg	atgaaagtaa	aaagcaaatg	tcagccaaat	ccagtgaaca	gcaataaaa	157500
aggagtaaac	tttttataac	tttttctact	tggatttcaa	cattcagtag	agcttttcga	157560
aatgtaagta	gtttacagta	ctggaggttt	gactagtcca	gtaggaattt	ggaggggaag	157620
gtcattctga	attgtaacaa	agtacaaaact	tccttgctgt	tttatttaag	tactgagagc	157680
taagcacctg	atgaagtgc	tgacctctct	ccagtgcacg	tggttgggta	cctgcctgac	157740
ttcaggagtg	gggtttatgt	ttctacacag	tgaccttttc	tctcgccctc	tcctccctct	157800
tgcccacaca	ccagttgatt	ggacctgggt	tgaactcctg	atccagacag	gcccagaca	157860
gttcttaatg	ttaaagaattt	tggggccggg	cacgggtggc	catgcctgta	attgcaacac	157920
tttggggaggc	cgagacaggc	ggatcacttg	aggtcagggg	ttcgaggcca	gcctggccaa	157980
catggtgaaa	ccctgtcttt	actaaaaata	caaaaattag	ctgggcatgg	tggcgcacgc	158040
ctgtaatccc	atggtgaaac	gtggctgaga	caggggaatc	gcttgaacct	ggaggcgag	158100
gttgtgcaat	gagccgagac	cgtgtcactg	cattccagcc	tgggtgacag	aggagagact	158160
tgtctccaaa	aataaaaaata	agaaaaagaa	ttttgggcta	ggtgcagtgg	ctcacgcctg	158220
ttattacagc	attttggag	gcccagatg	ggcagatcac	ttgaggacag	gagttcgaga	158280
ccagcctgga	caacatggtg	aaactccatc	tctactaaaa	agacaaaagt	tagccagatg	158340
tggtgatggg	cacctataat	cctagctcct	cgggaggctg	gggcaggaga	atcacttgaa	158400
cccaggaagc	agagattgca	gtgagccaag	atcacatctc	tgactccag	cctgggcaac	158460
agagcaagac	tctgtctcaa	aaaaaaaaaga	atttggccag	gcgcagtgg	tcacgcctgt	158520
aatcccagca	ctttggggagg	ccaaggcagg	cagatcacga	ggtcaggaga	tcgagattgt	158580
cctggctaac	gtctcaaaaa	cctgtctcta	ctaaaaatac	aaaacattag	ccgggtgtgg	158640
tgggtgggcac	ctgtagtccc	agctactagg	gaggctgagg	cagaggaagg	atgtgaaccc	158700
aggaggcgga	gcttgtagta	agccaagatc	gtgccactgc	actacagtct	gggcgacaga	158760
gtgagactcc	gtctcaaaaa	aaaaaagaat	tttggccggg	tgcggtggca	catgcctgta	158820
gtcccagcac	tttgggagac	caaagtgggc	ggattacctg	aggtcaggag	ttcaagacca	158880
gtccggccaa	tatggcgaaa	ccctgtctct	tactaaaaaa	aatacaaaaa	ttagccaggt	158940
gtggtggcgg	gcacctgggg	aggctgaggc	agggagaaat	gcttgaaccg	gggaggcaga	159000
gggtgtagta	agccaagatc	gtgccactgc	actccagagc	aagactcttt	ctcaaaaaaa	159060
aaaaaaaaaag	aattttgcat	gggggaaggag	agatactgtt	caccatctgg	aatggtgctt	159120
ggatgtggca	cttacaanaat	caggagccag	cactgcatgg	acaaacagaa	gcatgtgggc	159180
ctgagatagc	aggtagcttg	ataaccctga	agacatcctt	ggtttctgca	tctattcctg	159240
catccttgca	ttggactaca	ttaatctgtc	agttatcctt	ataatgattt	ttgatttttt	159300
ttttttgaga	tggagtcttc	ctcttgttgc	ccaggctgga	gtgcaatggc	acgatctcgg	159360
ctcaccacaa	cctccacctc	ccaggttcaa	gtgattctgc	tgccctcagcc	tcctgagtaa	159420
ctgggatttac	aggcatgcgc	caccacacct	ggctaatttt	gtatttttag	tagagacggg	159480
gtttctccat	ttgggtcagg	ctggctcaga	actcccaact	tcaggtgatc	accctgtctc	159540
ggcctcccaa	agtgtctggga	ttacaggcgt	aagccatggg	acccggtctg	ttttttgatt	159600
ttttgaaacc	agtcgaagt	gagttttttt	aattacgtga	aaggagtttg	gctaaaaata	159660
tgccatactg	ccctaattgcc	taatgattat	gtattctcag	catgtctgca	aagtactgct	159720
gattttctgga	gaataatttt	tctttagtaa	acttcactta	agtcgtcatg	tgtattctct	159780
caaaatggta	tcctaacctt	atggagctaa	aagacacccc	ttgtttttat	aacaagcagt	159840
tactgaggcc	caggaaaggg	agaagtcctt	ggcttgtgag	atgatcacca	ttagaactca	159900

106/122

```

ggcctggggc agtgcctttt catgcttctc agatccttcc aaagaataat gaagattata 159960
accgctttta gcaattgtaa taaaccacaga aatagaaagc tttttgggta gactactggg 160020
agaagtttgg cgggagagat aatttttaca aaatttgtaa atacctgcca attctatata 160080
ctaggcaagg tctctggcct tgtaaaaccc ctcaagggta caactttggg gggccacact 160140
aatagttacc cactgaggcc ctctccgggt gaacattgag cactagagga agcccctctg 160200
cttgggcagg actgggcgtg gtgcagagta ggagcgggta tactgtggat tctgggcagg 160260
tgagatggc cagtgatgtc caataaagga cactggaggg agcagtgtga gtaaaggccc 160320
tgagggcatt catgttcagg gaggggttgct gcccactggc ttgcttggca cacaggagag 160380
tgggtattcc tgccttagta actttatgta aacaagtatt tcctcagtc gtccctctca 160440
aactgcctgc tctggcacat tcagaatgtc acagaactca cctggatgca ttcagcccct 160500
tgctaaagg tgacagtgca tctccttccc caccacaccc ctcataccac tgaagcacct 160560
gtcagactgg ccagctctgt gggcaaggag cctagagagg gcttagtttc agcttgaaag 160620
gagctgggat ttaccaagaa gcaaatgaga gacgaggatt gcaacaactg tgccatttcc 160680
ccagcttcag ctgactctcg tatattgact gtgccttcag actcatcctg aagtgcaccc 160740
aggctggcct ctcccacatc acagtaagaa ttccacacac catacaactt ggaaagaggc 160800
tccagctgaa ggaagcccca cacttcttcc aagttttctc tagtcttctc ttcttggcaa 160860
agagtacctt ttgtttcttc taattatgta actattgggt tagtaaatat tcacccattc 160920
agtaccctg taagtggcag gcaactgtta caggagacaca ggaaggaata aaaacttgca 160980
ggcaccttgg agcttgcat ctattgaaga ggtaatggaa gttgggtag cagctaaact 161040
atgctgggat tggccaggcg cagtggctca cacctgtaat cccagcactt tggaggccaa 161100
ggtgggcaga tcatgaagt caggatcgga gaccatcctg gctaactatg tgaaaccccg 161160
tctctactaa aagtaaaaaa aaaaattagc caggtgtggg ggcgggcgcc tgtagtccca 161220
gctacttggg aggctgaggc aggagaatgg tgtgaaccca ggaggcgaag attgcatgta 161280
gccgagatgg caccactgca ctccagcctg ggtgacagag cgagactctg tctcagaaaa 161340
aaaaaatatg ctggtagttt tgattcaaga tggcctttgg agcccatgat ttaggtctcg 161400
taccaccaa ggtctactgg aaacatcag gctctcctgc tatagacca tagggagagc 161460
tgacaccctg agggggagct gaagagaagt gccccttctg tgcctgtca gctcatcct 161520
tccgcaagga ccagttgctg tgccactcca ttcaacttgc gcaagactgg aggttttctc 161580
tcaggtgttg agcacctggt ttacaagatg tcagcatctt gatgcctgag accatcaagg 161640
caagtctctg aacagggtt accttagagt aaggcttaga agaggccgta aagtcagctc 161700
cagctccgtg gctctgcaga gctttgggac atgtgaattc ttaaaaacaa gactattgta 161760
cagttactat atgcatgcag tataaaatta taaccttgga aaatcctagc tagctgttga 161820
gctaattcca taaagtaatc agctcctgag ttctgcatg gtaataataa tcagcataat 161880
gagtaaacac tgtgtgtgcc aggcagcgtc tcatttgatc cttgtgataa tcttgtagat 161940
actgattttc tcccttcttt aaacaaggt tttttttttt ttttagagag ggtctcacta 162000
gttgcccgag gctagtcctg aattc

```

<210> 37
<211> 1350
<212> DNA
<213> Homo Sapien

<220>
<221> CDS
<222> (213) ... (920)

<300>
<308> GenBank AJ242973
<309> 1999-10-26

```

<400> 37
gcgcccgct cgacgtgaca gccggtacgc ccgggtttgg gcaacctcga ttacgggcgg 60
cttccaggcc cgccagcagc gcccgcgcgc gcccgccgcg cccctgccc ccccccgggt 120
ccggcccgcg accccactct ctgcccgttcc ggctgcccgt ccgctgccc tagcgcctc 180
ccccgggacc acccttcggc tggcgcctcc cc atg ctc tgc gcc acc cgg agg 233
Met Leu Ser Ala Thr Arg Arg
1 5

```

```

gct tgc cag ctc ctc ctc ctc cac agc ctc ttt ccc gtc ccg agg atg 281
Ala Cys Gln Leu Leu Leu Leu His Ser Leu Phe Pro Val Pro Arg Met

```

107/122

10	15	20	
ggc aac tcg gcc tcg aac atc gtc agc ccc cag gag gcc ttg ccg ggc Gly Asn Ser Ala Ser Asn Ile Val Ser Pro Gln Glu Ala Leu Pro Gly 25 30 35			329
cgg aag gaa cag acc cct gta gcg gcc aaa cat cat gtc aat ggc aac Arg Lys Glu Gln Thr Pro Val Ala Ala Lys His His Val Asn Gly Asn 40 45 50 55			377
aga aca gtc gaa cct ttc cca gag gga aca cag atg gct gta ttt gga Arg Thr Val Glu Pro Phe Pro Glu Gly Thr Gln Met Ala Val Phe Gly 60 65 70			425
atg gga tgt ttc tgg gga gct gaa agg aaa ttc tgg gtc ttg aaa gga Met Gly Cys Phe Trp Gly Ala Glu Arg Lys Phe Trp Val Leu Lys Gly 75 80 85			473
gtg tat tca act caa gtt ggt ttt gca gga ggc tat act tca aat cct Val Tyr Ser Thr Gln Val Gly Phe Ala Gly Gly Tyr Thr Ser Asn Pro 90 95 100			521
act tat aaa gaa gtc tgc tca gaa aaa act ggc cat gca gaa gtc gtc Thr Tyr Lys Glu Val Cys Ser Glu Lys Thr Gly His Ala Glu Val Val 105 110 115			569
cga gtg gtg tac cag cca gaa cac atg agt ttt gag gaa ctg ctc aag Arg Val Val Tyr Gln Pro Glu His Met Ser Phe Glu Glu Leu Leu Lys 120 125 130 135			617
gtc ttc tgg gag aat cac gac ccg acc caa ggt atg cgc cag ggg aac Val Phe Trp Glu Asn His Asp Pro Thr Gln Gly Met Arg Gln Gly Asn 140 145 150			665
gac cat ggc act cag tac cgc tcg gcc atc tac ccg acc tct gcc aag Asp His Gly Thr Gln Tyr Arg Ser Ala Ile Tyr Pro Thr Ser Ala Lys 155 160 165			713
caa atg gag gca gcc ctg agc tcc aaa gag aac tac caa aag gtt ctt Gln Met Glu Ala Ala Leu Ser Ser Lys Glu Asn Tyr Gln Lys Val Leu 170 175 180			761
tca gag cac ggc ttc ggc ccc atc act acc gac atc cgg gag gga cag Ser Glu His Gly Phe Gly Pro Ile Thr Thr Asp Ile Arg Glu Gly Gln 185 190 195			809
act ttc tac tat gcg gaa gac tac cac cag cag tac ctg agc aag aac Thr Phe Tyr Tyr Ala Glu Asp Tyr His Gln Gln Tyr Leu Ser Lys Asn 200 205 210 215			857
ccc aat ggc tac tgc ggc ctt ggg gcc acc gcc gtg tcc tgc cca gtg Pro Asn Gly Tyr Cys Gly Leu Gly Gly Thr Gly Val Ser Cys Pro Val 220 225 230			905
ggt att aaa aaa taa ttgctcccca catggtgggc ctttgaggtt ccagtaaaaa Gly Ile Lys Lys * 235			960
tgctttcaac aaattgggca atgcttgtgt gattcacaat cgtggcattt aaagtgcaca aagtacaaag gaattttatag agattgggtt taccgaagta taatctatag gaggcgcgat			1020 1080

108/122

```

ggcaagttga taaaatgtga cttatctcct aataagttat ggtgggagtg gagctgtgcg 1140
gtttcctgtg tcttctgggg tctgagtga gatagcaggg atgctgtgtt cacccttctt 1200
ggtagaagct aaggtgtgag ctgggaggtt gctggacagg atgggggacc ccagaagtcc 1260
tttatctgtg ctctctgccc gccagtgcct tacaatttgc aaacgtgtat agcctcagtg 1320
actcattcgc tgaatacctt cgctttacca 1350

```

<210> 38
 <211> 235
 <212> PRT
 <213> Homo Sapien

<400> 38

Met	Leu	Ser	Ala	Thr	Arg	Arg	Ala	Cys	Gln	Leu	Leu	Leu	Leu	His	Ser
1			5						10					15	
Leu	Phe	Pro	Val	Pro	Arg	Met	Gly	Asn	Ser	Ala	Ser	Asn	Ile	Val	Ser
			20					25					30		
Pro	Gln	Glu	Ala	Leu	Pro	Gly	Arg	Lys	Glu	Gln	Thr	Pro	Val	Ala	Ala
			35				40					45			
Lys	His	His	Val	Asn	Gly	Asn	Arg	Thr	Val	Glu	Pro	Phe	Pro	Glu	Gly
	50				55					60					
Thr	Gln	Met	Ala	Val	Phe	Gly	Met	Gly	Cys	Phe	Trp	Gly	Ala	Glu	Arg
65					70					75				80	
Lys	Phe	Trp	Val	Leu	Lys	Gly	Val	Tyr	Ser	Thr	Gln	Val	Gly	Phe	Ala
			85						90					95	
Gly	Gly	Tyr	Thr	Ser	Asn	Pro	Thr	Tyr	Lys	Glu	Val	Cys	Ser	Glu	Lys
			100					105					110		
Thr	Gly	His	Ala	Glu	Val	Val	Arg	Val	Val	Tyr	Gln	Pro	Glu	His	Met
			115				120				125				
Ser	Phe	Glu	Glu	Leu	Leu	Lys	Val	Phe	Trp	Glu	Asn	His	Asp	Pro	Thr
			130			135					140				
Gln	Gly	Met	Arg	Gln	Gly	Asn	Asp	His	Gly	Thr	Gln	Tyr	Arg	Ser	Ala
145					150					155				160	
Ile	Tyr	Pro	Thr	Ser	Ala	Lys	Gln	Met	Glu	Ala	Ala	Leu	Ser	Ser	Lys
			165						170					175	
Glu	Asn	Tyr	Gln	Lys	Val	Leu	Ser	Glu	His	Gly	Phe	Gly	Pro	Ile	Thr
			180					185					190		
Thr	Asp	Ile	Arg	Glu	Gly	Gln	Thr	Phe	Tyr	Tyr	Ala	Glu	Asp	Tyr	His
			195				200					205			
Gln	Gln	Tyr	Leu	Ser	Lys	Asn	Pro	Asn	Gly	Tyr	Cys	Gly	Leu	Gly	Gly
			210			215					220				
Thr	Gly	Val	Ser	Cys	Pro	Val	Gly	Ile	Lys	Lys					
225					230					235					

<210> 39
 <211> 481
 <212> DNA
 <213> Homo Sapien

<300>
 <308> GenBank AW195104
 <309> 1999-11-29

<400> 39

ggcattattg	gactgtaggt	ttttattaaa	acaaacattt	ctcatagctc	taagcaaagc	60
attagaattc	atcaagcgga	ctcacatctt	ttctctgcac	agagaggggc	tgaaaagggg	120
gagaaagtcc	cttatgtatg	tctagatttg	gtaaagcgaa	ggatttcagc	gaatgagtca	180
ctgaggctat	acacgtttgc	aaattgtaag	gcactggcgg	gcagagagca	cagataaagg	240
acttctgggg	tcccccatcc	tgtccagcaa	cctcccagct	cacaccttag	cttctaccaa	300
gaaggggtgaa	cacagcatcc	ctgctatctt	cactcagacc	ccagaaaacc	cagggaaacc	360
cgacagctcc	actcccacca	taacttatta	ggagataagt	cacattttat	caacttgcca	420

109/122

tcgcgccctcc tatagattat acttcggttaa acccaatctg tataaattcc tttgtacttt 480
g 481

<210> 40
<211> 390
<212> DNA
<213> Homo Sapien

<300>
<308> GenBank AW874187
<309> 2000-05-22

<400> 40
ttttttttat tggactgtag gtttttatta aaacaaacat ttctcatagc tctaagcaaa 60
gcattagaat tcatcaagcg gactcacatc ttttctctgc acagagaggg ctgaaaaggg 120
agagaaagcc ccttatgtat gtctagattt ggtaaagcga aggatttcag cgaatgagtc 180
actgaggcta tacacgtttg caaattgtaa ggcactggcg ggcagagagc acagataaag 240
gacttttggg ggcccccat tcctgtccag caacctccca gctcacacct tagctttctac 300
caagaagggg tgaacacagc atccctgcta tcttactca gacccccaga agacacagga 360
aaccgcacag ctccactccc accataactt 390

<210> 41
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 41
agcggataac aatttcacac agggagctag cttggaagat tgc 43

<210> 42
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 42
gtccaatata tgcaaacagt tg 22

<210> 43
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 43
agcggataac aatttcacac agg 23

<210> 44
<211> 18
<212> DNA
<213> Artificial Sequence

<220>

110/122

<223> Oligonucleotide Primer

<400> 44

actgagcctg ctgcataa

18

<210> 45

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 45

tctcaatcat gtgcattgag g

21

<210> 46

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 46

agcggataac aatttcacac agggatcaca cagccatcag cag

43

<210> 47

<211> 23

<212> DNA

<213> oligonucleotide primer

<400> 47

agcggataac aatttcacac agg

23

<210> 48

<211> 18

<212> DNA

<213> Oligonucleotide primer

<400> 48

ctggcgccac gtggtcaa

18

<210> 49

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 49

tttctctgca cagagagggc

20

<210> 50

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

111/122

<223> Oligonucleotide Primer

<400> 50

agcggataac aatttcacac agggctgaaa tccttcgctt tacc

44

<210> 51

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 51

agcggataac aatttcacac agg

23

<210> 52

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 52

ctgaaaaggg agagaaag

18

<210> 53

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 53

tcccaaagtg ctggaattac

20

<210> 54

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 54

gtccaatata tgcaaacagt tg

22

<210> 55

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide Primer

<400> 55

cccacagcag ttaatccttc

20

112/122

<210> 56
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 56
gcgctcctgt cggtgccca 18

<210> 57
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 57
gcctgactgg tggggccc 18

<210> 58
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 58
catgcatgca cggtc 15

<210> 59
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 59
cagagagtac ccctcgaccg tgcatgcatg 30

<210> 60
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 60
catgcatgca cggtt 15

<210> 61
<211> 30
<212> DNA
<213> Artificial Sequence

113/122

<220>
<223> Oligonucleotide primer

<400> 61
gtacgtacgt gccaaactccc catgagagac 30

<210> 62
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 62
catgcatgca cggt 14

<210> 63
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 63
gcctgactgg tggggccc 18

<210> 64
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 64
gtgctgcagg tgtaaacttg taccag 26

<210> 65
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 65
cacggatccg gtagcagcgg tagagttg 28

<210> 66
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 66
actgggcatg tggagacag 19

114/122

<210> 67
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 67
gcactttctt gccatgag 18

<210> 68
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 68
tcagtcacga cggt 14

<210> 69
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 69
cggataacaa ttct 14

<210> 70
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 70
caatttcac gctggatgca atctgggcta tgagatc 37

<210> 71
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 71
caatttcaca cagcggatgc ttcttttggc tctgact 37

<210> 72
<211> 40
<212> DNA
<213> Artificial Sequence

115/122

<220>
<223> Oligonucleotide primer

<400> 72
tcagtcacga cggttgatgc caataaaagt gactctcagc 40

<210> 73
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 73
cggataacaa tttcggatgc actgggagca ttgaggc 37

<210> 74
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 74
tcagtcacga cggttgatga gcagatccct ggacaggc 38

<210> 75
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 75
cggataacaa tttcggatgg acaaaatacc tgtattcc 38

<210> 76
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 76
tcagtcacga cggttgatgc agagcagctc cgagtc 36

<210> 77
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 77
cagcggatgatt cattggatgc aggaagctct gg 32

116/122

<210> 78
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 78
tcagtcacga cggtggatgc ccacatgcca cccactac 38

<210> 79
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 79
cggataacaa ttctggatgc ccgtcaggta ccacg 35

<210> 80
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 80
tcagtcacga cggtggatgc ccacagtggg gcttcag 37

<210> 81
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 81
gctcatacct tgcaggatga cg 22

<210> 82
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 82
tcagtcacga cggtggatga ccagctgttc gtgttc 36

<210> 83
<211> 34
<212> DNA
<213> Artificial Sequence

117/122

<220>
<223> Oligonucleotide primer

<400> 83
tacatggagt tcggggatgc acacggcgac tctc 34

<210> 84
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 84
tcagtcacga cggtggatgg ggaagagcag agatatacgt 40

<210> 85
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 85
gaggggctga tccaggatgg gtgctccac 29

<210> 86
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 86
tgaagcactt gaaggatgag ggtgtctgcg 30

<210> 87
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 87
cggataacaa tttcggatgc tgcgtgatga tgaaatcg 38

<210> 88
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 88
gatgaagctc ccaggatgcc agaggc 26

118/122

<210> 89
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 89
gccgccggtg taggatgctg ctggtgc 27

<210> 90
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Template

<400> 90
cgcagggttt cctcgtcgca ctgggcatgt g 31

<210> 91
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Biotinylated primer

<400> 91
tgcttatccc tgtagctacc ctgtcttggc cttgcagatc caa 43

<210> 92
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 92
agcggataac aatttcacac aggccatcac accgcggtac tg 42

<210> 93
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 93
cccagtcacg acgttgtaaa acgtcttggc cttgcagatc caag 44

<210> 94
<211> 42
<212> DNA
<213> Artificial Sequence

119/122

<220>
<223> Oligonucleotide primer

<400> 94
agcggataac aatttcacac aggccatcac accgcggtac tg 42

<210> 95
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 95
ctccagctgg gcaggagtgc 20

<210> 96
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 96
cacttcagtc gtcacct 17

<210> 97
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Biotinylated primer

<400> 97
cccagtcacg acgttgtaaa acg 23

<210> 98
<211> 100
<212> DNA
<213> Homo sapien

<400> 98
cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60
agatcaataa agtcagagcc aaaagaagca gcaaaatgta 100

<210> 99
<211> 100
<212> DNA
<213> Homo sapien

<400> 99
cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60
agatcagtaa agtcagagcc aaaagaagca gcaaaatgta 100

<210> 100
<211> 100
<212> DNA

120/122

<213> Homo sapien

<400> 100
gaattatattt tgtgttttcta aaactatggt tcccaataaa agtgactctc agcgagcctc 60
aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> 101
<211> 100
<212> DNA
<213> Homo sapien

<400> 101
gaattatattt tgtgttttcta aaactatggt tcccaataaa agtgactctc agcaagcctc 60
aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> 102
<211> 84
<212> DNA
<213> Homo sapien

<400> 102
taataggact acttctaadc tgtaagagca gatccctgga caggcgagga atacaggat 60
tttgccttg aagtaacctt tcag 84

<210> 103
<211> 84
<212> DNA
<213> Homo sapien

<400> 103
taataggact acttctaadc tgtaagagca gatccctgga caggcaagga atacaggat 60
tttgccttg aagtaacctt tcag 84

<210> 104
<211> 100
<212> DNA
<213> Homo sapien

<400> 104
ctcaccatgg gcatttgatt gcagagcagc tccgagtcgg tccagagctt cctgcagtca 60
atgatcaccg ctgtgggcat ccctgaggtc atgtctcgta 100

<210> 105
<211> 100
<212> DNA
<213> Homo sapien

<400> 105
ctcaccatgg gcatttgatt gcagagcagc tccgagtcca tccagagctt cctgcagtca 60
atgatcaccg ctgtgggcat ccctgaggtc atgtctcgta 100

<210> 106
<211> 100
<212> DNA
<213> Homo sapien

<400> 106
agcaaggact cctgcaaggg ggacagtggg ggcccacatg ccacccacta ccagggcacg 60
tggtacctga cgggcatcgt cagctggggc cagggtgcg 100

121/122

<210> 107
<211> 100
<212> DNA
<213> Homo sapien

<400> 107
agcaaggact cctgcaaggg ggacagtgga ggcccacatg ccacccacta ccgggggcacg 60
tggtaacctga cgggcatcgt cagctggggc cagggctgcg 100

<210> 108
<211> 100
<212> DNA
<213> Homo sapien

<400> 108
caataactct aatgcagcgg aagatgacct gccacagtg gagcttcagg gcgtggtgcc 60
ccggggcgctc aacctgcaag gtatgagcat accccccttc 100

<210> 109
<211> 100
<212> DNA
<213> Homo sapien

<400> 109
caataactct aatgcagcgg aagatgacct gccacagtg gagcttcagg gcttggtgcc 60
ccggggcgctc aacctgcaag gtatgagcat accccccttc 100

<210> 110
<211> 100
<212> DNA
<213> Homo sapien

<400> 110
ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatcat gagagtcgcc 60
gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> 111
<211> 100
<212> DNA
<213> Homo sapien

<400> 111
ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatcat gagagtcgcc 60
gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> 112
<211> 100
<212> DNA
<213> Homo sapien

<400> 112
ggataacctt ggctgtacct cctggggaag agcagagata tacgtgccag gtggagcacc 60
caggcctgga tcagcccctc attgtgatct gggagccctc 100

<210> 113
<211> 100
<212> DNA
<213> Homo sapien

<400> 113

122/122

ggataacctt ggctgtaccc cctggggaag agcagagata tacgtaccag gtggagcacc 60
caggcctgga tcagccctc attgtgatct gggagccctc 100

<210> 114
<211> 80
<212> DNA
<213> Homo sapien

<400> 114
tgaagcactt gaaggagaag gtgtctgcgg gagccgattt catcatcacg cagcttttct 60
ttgaggctga cacattcttc 80

<210> 115
<211> 80
<212> DNA
<213> Homo sapien

<400> 115
tgaagcactt gaaggagaag gtgtctgcgg gagtcgattt catcatcacg cagcttttct 60
ttgaggctga cacattcttc 80

<210> 116
<211> 80
<212> DNA
<213> Homo sapien

<400> 116
tccagatgaa gctcccagaa tgccagaggc tgctccccgc gtggcccctg caccagcagc 60
tcctacaccg gcggcccctg 80

<210> 117
<211> 80
<212> DNA
<213> Homo sapien

<400> 117
tccagatgaa gctcccagaa tgccagaggc tgctccccgc gtggcccctg caccagcagc 60
tcctacaccg gcggcccctg 80

<210> 118
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Hair pin structure

<400> 118
cagagagtac ccctcaaccg tgcattcatg aaacatgcat gcacgggt 48

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
19 April 2001 (19.04.2001)

PCT

(10) International Publication Number
WO 01/027857 A3

(51) International Patent Classification⁷: **G06F 19/00**

US 09/663,968 (CIP)

Filed on

19 September 2000 (19.09.2000)

(21) International Application Number: PCT/US00/28413

US

60/217,251 (CIP)

Filed on

10 July 2000 (10.07.2000)

(22) International Filing Date: 13 October 2000 (13.10.2000)

(25) Filing Language: English

(71) Applicant (for all designated States except US): SE-
QUENOM, INC. [US/US]; 3595 John Hopkins Court,
San Diego, CA 92121 (US).

(26) Publication Language: English

(72) Inventors; and

(30) Priority Data:

60/159,176	13 October 1999 (13.10.1999)	US
60/217,658	10 July 2000 (10.07.2000)	US
60/217,251	10 July 2000 (10.07.2000)	US
09/663,968	19 September 2000 (19.09.2000)	US

(75) Inventors/Applicants (for US only): BRAUN, Andreas

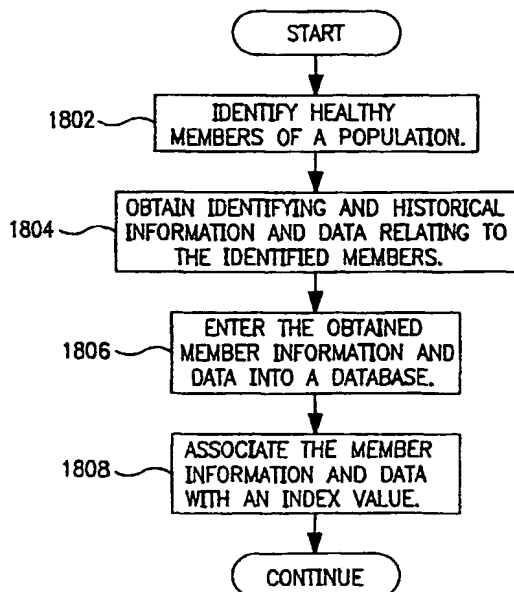
[DE/US]; 11237-6 Carmel Creek Road, San Diego,
CA 92130 (US). KÖSTER, Hubert [DE/CH]; Via
Delle Scuole 1, CH-6900 Lugano-Cassarate (CH). VAN
DEN BOOM, Dirk [DE/DE]; Eppendorfer Weg 205
D, D-20253 Hamburg (DE). PING, Yip [US/US]; 3641
Copley Avenue, San Diego, CA 92116 (US). RODI,
Charlie [US/US]; 13823 Recuerdo Drive, Del Mar, CA
92014 (US). HE, Liyan [CN/US]; 10948 Creek Bridge
Place, San Diego, CA 92128 (US). CHIU, Norman
[CA/US]; 1128 Caminito Alvarez, San Diego, CA 92126
(US). JURINKE, Christian [DE/DE]; Rombergstrasse
22, 20255 Hamburg (DE).

(63) Related by continuation (CON) or continuation-in-part
(CIP) to earlier applications:

US	60/159,176 (CIP)
Filed on	13 October 1999 (13.10.1999)
US	60/217,658 (CIP)
Filed on	10 July 2000 (10.07.2000)

[Continued on next page]

(54) Title: METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS



(57) Abstract: Process and methods for creating a database of genomic samples from healthy human donors, methods that use the database to identify and correlate polymorphic genetic markers and other markers with diseases and conditions are provided.

WO 01/027857 A3



(74) **Agents:** SEIDMAN, Stephanie, L. et al.; Heller Ehrman White & McAuliffe, Suite 700, 4250 Executive Square, La Jolla, CA 92037 (US).

patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(81) **Designated States (national):** AE, AG, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

Published:

— with international search report

(88) **Date of publication of the international search report:**
3 October 2002

(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/28413

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 05323 A (AFFYMETRIX INC) 4 February 1999 (1999-02-04) abstract; claims 1,4	1-100
X	WO 97 40462 A (SPECTRA BIOMEDICAL INC) 30 October 1997 (1997-10-30) page 4, line 2 - line 22 page 7, line 3 -page 8, line 4	1-100
X	WO 98 24935 A (AN GANG ;HARA MARK O (US); RALPH DAVID (US); VELTRI ROBERT (US); U) 11 June 1998 (1998-06-11) page 4, line 27 -page 5, line 6 page 6, line 14 - line 18	1-100

-/--

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

10 September 2001

Date of mailing of the international search report

28/09/2001

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Filloy Garcia, E

INTERNATIONAL SEARCH REPORT

Intern: # Application No
PCT/US 00/28413

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	COLLINS F S ET AL: "A DNA Polymorphism Discovery Resource for Research on Human Genetic Variation" GENOME RESEARCH, vol. 8, 1998, pages 1229-1231, XP002177106 the whole document	1-100
P,X	WO 00 51053 A (BRYANT STEPHEN PAUL ;GEMINI RESEARCH LTD (GB); KELLY PAUL JAMES (G) 31 August 2000 (2000-08-31) abstract; claims 1-24	1-100
Y	WO 98 35609 A (HELMS RONALD W ;TOMASKO LISA (US); BIOMAR INTERNATIONAL INC (US);) 20 August 1998 (1998-08-20) abstract; claims 1-25	1-100
Y	SARKAR C ET AL: "Human Genetic Bi-allelic Sequences (HGBASE), a Database of Intra-genic Polymorphisms" MEM INST OSWALDO CRUZ, 'Online! vol. 93, no. 5, September 1998 (1998-09) - October 1998 (1998-10), pages 693-694, XP002177107 Rio de Janeiro Retrieved from the Internet: <URL:http://www.cgb.ki.se/cgb/groups/brook es/publications.htm> 'retrieved on 2001-09-05! the whole document	1-100
A	FOSTER M W AND FREEMAN W L: "Naming Names in Human Genetic Variation Research" GENOME RESEARCH, vol. 8, 1998, pages 755-757, XP002177108 the whole document	2,9,27, 55,72

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/28413

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9905323 A	04-02-1999	EP 1002264 A	24-05-2000
		EP 1009861 A	21-06-2000
		EP 0998697 A	10-05-2000
		EP 1007737 A	14-06-2000
		WO 9905574 A	04-02-1999
		WO 9905324 A	04-02-1999
		WO 9905591 A	04-02-1999
		US 6229911 B	08-05-2001
		US 6188783 B	13-02-2001
WO 9740462 A	30-10-1997	AU 2734197 A	12-11-1997
		EP 0897567 A	24-02-1999
		JP 2000508912 T	18-07-2000
WO 9824935 A	11-06-1998	AU 722819 B	10-08-2000
		AU 5515198 A	29-06-1998
		EP 0960214 A	01-12-1999
		US 6190857 B	20-02-2001
WO 0051053 A	31-08-2000	AU 2815900 A	14-09-2000
WO 9835609 A	20-08-1998	US 6059724 A	09-05-2000
		AU 6151498 A	08-09-1998
		BR 9807366 A	18-04-2000
		CN 1268033 T	27-09-2000
		EP 0973435 A	26-01-2000

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☒ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.